

TOWN OF WINCHESTER, MASSACHUSETTS



McCall Middle School Traffic Improvements

Bid Documents

March 18, 2020

Due date for bids:

Thursday, April 9, 2020

10:00 AM

Lisa Wong,
Town Manager

**ADVERTISEMENT FOR BIDS
TOWN OF WINCHESTER
MCCALL MIDDLE SCHOOL TRAFFIC IMPROVEMENT PROJECT**

Sealed unit price bids will be received by the Town of Winchester Department of Engineering, at 71 Mt. Vernon Street, Lower Level Town Hall, Winchester, MA 01890, until 10:00 AM, on **Thursday, April 9, 2020** and at that place and time be publicly opened and read aloud. All bidders will be notified of the apparent low bidder. All bidding procedures will be in accordance with the Massachusetts General Laws Chapter 30, Section 39M inclusive as amended.

Pre-Bid Conference will be held on Thursday, March 26, 2020 at 9:00 AM at the Office of the Town Engineer, Lower Level Town Hall, 71 Mt. Vernon Street, Winchester, MA 01890.

Prevailing Wages, as determined under M.G.L. c. 149, § 26-27H shall apply on this project. Materials, equipment and supplies used on this project are exempt from sales tax to the extent provided by M.G.L. c. 64H, § 6(f). The Project is expected to commence on or about **June 15, 2020**, and be completed no later than **October 31, 2020**. Time is of the essence for the completion of this project.

Copies of these documents may be obtained from Accent Blueprint. To access the documents go to www.accentblueprints.com and set up an account. A copy of the plans and specifications is available for review at the Engineering Department, 71 Mt Vernon Street, Winchester, MA 01890. The Instruction to Bidders, Form of Bid, Form of Contract, Plans, Specifications, and Form of Bid Bond, Performance and Payment Bond, and other contract documents will be available starting March 18, 2020 between the hours of 8:00 a.m. and 7:00 p.m. on Mondays and from 8:00 a.m. and 4:00 p.m. on Tuesday through Thursdays and from 8:00 a.m. and 12:00 noon on Fridays and may be examined and obtained at the Department of Engineering, 71 Mt. Vernon Street, Town Hall, Winchester, Massachusetts.

Bid Deposits shall be submitted in the amount of 5% of the bid price including any alternates. The Bid Deposit shall be made payable to the Town of Winchester and shall be either in the form of cash, certified check, treasurer's or cashier's check issued by a responsible bank or trust company, or a bid bond issued by a surety licensed to do business in the Commonwealth of Massachusetts; and shall be conditioned upon the faithful performance by the principal of the agreement contained in the bid. The Town of Winchester reserves the right to reject or approve a surety. The Bid Deposits of the three (3) lowest responsible and eligible bidders shall be retained until the execution and delivery of the Contract.

The contract will be awarded to the bidder deemed by the Town of Winchester to be the lowest responsible and eligible bidder. Selection of the successful bidder will be based upon bidder qualifications, including evidence of past performance on similar projects and bid price. The Contract award is be subject to the availability of funding.

The successful general bidder will be required to furnish a Performance Bond and a Labor and Materials Bond, each of which shall be in the amount equal to one hundred percent (100%) of the contract price.

The Town of Winchester reserves the right to reject any bid which, in its judgment, fails to meet the requirements of this Advertisement for Bids or which is incomplete, conditional, or obscure, or which contains additions or irregularities, or in which errors occur in addition to the foregoing. The Town of Winchester also reserves the right to reject any and all proposals if it deems such rejection(s) to be in the best interest of the Town. The Town of Winchester further reserves the right to waive any minor discrepancies or informalities, to permit a bidder to clarify discrepancies or to conduct discussions with all qualified bidders in any manner necessary to serve the best interests of the Town. Any fees or other expenses of the bidders associated with this Advertisement for Bid process are solely the responsibility of the bidders.

No bidder may withdraw its bid within sixty (60) days (Saturdays, Sundays and Holidays excluded) after the date designated above for the opening of the bids. Any bid submitted will be binding for sixty (60) days after the time of bid opening.

All telephone calls and correspondence in connection with this Project should be addressed to Margaret T. White at 781-721-7165 or by email at mwhite@winchester.us.

The Town of Winchester is an affirmative action/equal opportunity employer, and encourages participation from certified minority and women-owned businesses in this Advertisement for Bid. The successful bidder must ensure that employees and applicants for employment are not discriminated against because of their race, color, religion, sex, national origin, or any other basis prohibited by law.

Each bidder shall visit the site of the proposed work and shall fully acquaint himself with the conditions as they exist and shall also thoroughly examine the contract documents. Failure of bidder to visit the site and acquaint himself with the contract documents shall in no way relieve the bidder from any obligation with respect to his bid.

INSTRUCTIONS TO BIDDERS

1. GENERAL; DEFINITIONS

- a. In accordance with the Advertisement for Bids, a copy of which is bound herewith, the Town of Winchester (the “Owner”), invites sealed bids on the separate copies of Bid Forms furnished for that purpose, for construction of the McCall Middle School Roadway Improvement Project (“Project”). The “Work” consists of the Project as more specifically described in the contract drawings and specifications and shall include all incidental work necessary or customarily done for the completion of the Project.
- b. The Bound-in Bid Forms in the Contract Documents are for continuity and the convenience of bidders and are not to be detached from the Contract Documents, filled out or executed.
- c. The following definitions shall apply in these Instructions and in the other Contract Documents, unless otherwise specified.
 - I. The term “bidding documents” shall include the Advertisement for Bids, these Instructions, the bid forms, bond forms, contract forms and other Contract Documents bound herewith, and shall include the Drawings, the Specifications, and all Addenda issued prior to receipt of bids.
 - II. The term “Contract Documents” shall mean the Contract entered into between the Owner and the successful bidder, including all documents enumerated as Contract Documents in the Agreement between Owner and Contractor, and all Modifications (as defined in the Contract) issued after execution of the Contract.
 - III. The terms “Addenda” and “Addendum” shall mean written documents and/or drawings issued by the Owner prior to execution of the Contract which supplement, modify, correct, explain or interpret the bidding documents.

2. RECEIPT, OPENING AND REJECTION OF BIDS

- a. Bids will be received by the Owner at the Department of Engineering, 71 Mt. Vernon Street, Town Hall, Winchester, Massachusetts, until **Thursday, April 9, 2020 at 10:00 AM** and then at said office publicly opened and read aloud.
- b. The Owner reserves the right to:
 - I. reject any proposal which is not accompanied by the required bid deposit or which, in the Owner’s judgment, fails to meet the requirements of the Advertisement for Bids, the Instructions or statutory requirements, or

which is incomplete, conditional, or obscure, or which contains additions or irregularities, or in which errors occur in addition to the foregoing;

- II. reject any and all proposals if it deems such rejection(s) to be in the best interest of the Owner;
- III. consider informal and reject any bid which contains erasures, alterations, additions, errors or irregularities of any kind, or which contains proposed prices for any class or item of work which are, in the judgment of the Town, substantially less or more than the actual cost to complete the Work as that term is defined in the Contract Document; or
- IV. notwithstanding its rights under items 2b(i)-(iii) above, waive any minor discrepancies or informalities, to permit a bidder to clarify discrepancies or to conduct discussions with all qualified bidders in any manner necessary to serve the best interests of the Owner.

Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within sixty (60) days after the actual date of the opening thereof.

3. CONTRACT AWARD

The Owner will award the contract to the lowest eligible and responsible bidder within thirty business (30) days, after (i) the opening of bids or (ii) the receipt by the Owner of any approvals necessary from Federal or State agencies in connection with the project, whichever is later. As used herein, the term "lowest responsible and eligible bidder" shall mean the bidder (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work as further described in the Contract Document; (2) who shall certify that he is able to furnish labor that can work in harmony with all elements of labor employed or to be employed in the Work; and (3) who obtains within ten (10) days of the notification of contract award the security required under Section 7 below.

The successful bidder will be notified in writing, by mail or otherwise, that its bid has been accepted and that it has been awarded the Contract. The successful bidder shall execute the Contract and furnish the required bonds, at the offices of the Town if requested, within ten (10) days after presentation of the contract to the bidder or notice to the bidder that the Contract is ready for execution.

The Owner shall not enter into a contract with, and shall not approve as a subcontractor furnishing labor and materials for a part of any work of this contract, a foreign corporation which has not filed with the Owner a certificate of the Secretary of State of the Commonwealth of Massachusetts stating that such corporation has complied with M.G.L. c. 156D and the date of such compliance. The Owner shall report to said Secretary of State and to the Department of Corporations and Taxation of the Commonwealth of Massachusetts any foreign corporation performing any work under this contract or any such subcontract, and any person, other than a

corporation, performing work under this contract or any such subcontract, and residing or having a principal place of business outside the Commonwealth of Massachusetts.

4. PREPARATION OF BIDS

Each bid must be submitted on the prescribed bid forms, must be signed and accompanied by the Non-Collusion Affidavit form, and all Additional Bid Requirements that are supplied to you in the Proposal Package. The bid shall state the legal name of the bidder and shall be signed in ink by a person or persons legally authorized to bind the bidder to a contract. The name and title of the person or persons signing the bid shall be typed or printed below the signature(s).

All blank spaces for bid prices must be filled in, with ink or typewriter in both words and figures, and all of the foregoing Certifications must be fully completed and executed when submitted. Where required, bid prices for each item on the bid form shall be stated in both words and figures. Where itemized lump sum or unit prices are called for, all such prices shall be provided by the bidder. In the event of a discrepancy between prices written in words and prices written in figures, the written words shall govern.

Each bid must be submitted in a sealed envelope bearing on the outside the name of bidder, his address and the name and contract number of the project for which the bid is submitted. If the bid is mailed, the bidder shall enclose its sealed bid and bid deposit in an outer envelope addressed as follows:

FROM: [Bidder's name and business address]
RE: **McCall Middle School Roadway Improvement Project**
TO: **Office of the Town Engineer**
71 Mt Vernon Street
Winchester, MA 01890

All bidders are cautioned to allow ample time for transmittal of bids. Bidders are solely responsible for delivery to and receipt by the Owner of bids by the bid deadline. Bids received after the specified time will not be accepted or recognized. The time of receipt will determine the acceptability of mailed bids, regardless of postmark.

5. EMAIL MODIFICATION

Any bidder may modify his bid by email communication at any time prior to the scheduled closing time for receipt of bids provided such email communication is received by the Owner prior to the closing time and, provided further, the Owner is satisfied that a written confirmation of the email modification over the signature of the bidder was mailed prior to the closing time. The email communication should not reveal the bid price but should provide the addition or subtraction or other modifications so that the final prices of terms will not be known by the Owner until the sealed bid is opened. If written confirmation is not received within two (2) business days after the closing time, no consideration will be given to the email modification.

6. QUALIFICATIONS OF BIDDER

The Contract will be awarded to the lowest bid submitted by a responsible and eligible bidder. As used herein, the term “lowest responsible and eligible bidder” shall mean the following: To be considered “responsible” the bidder shall possess the skill, ability and integrity necessary to faithfully perform the work called for by the Contract, based upon a determination of competent workmanship and financial soundness in accordance with the provisions of M.G.L. Ch. 30 Section 39M. To be considered “eligible” the bidder shall be able to meet all requirements for bidders set forth in M.G.L. Ch. 30, Section 39M and not be debarred from bidding, and shall certify that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work.

The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the Work, and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. Without limitation, the investigation of a bidder may seek to determine whether the bidder is authorized to do business in the Commonwealth of Massachusetts, has had relevant previous experience, and has available equipment, forces and financial resources adequate to assure the Owner that the Work will be completed in accordance with the Contract Documents. The Owner may contact references, and may consider evidence of problems with past performance, such as defaults, contract terminations, imposition of damages or other failures to perform. The amount of other Work to which the bidder is committed may also be considered. The scope of the Owner’s investigation of any particular bidder shall remain within the Owner’s discretion.

To assist the Owner in its investigation of bidder qualifications, each bid **must include** the name of the Superintendent who is to be used on this project, and his/her experience. Each bid **must also include** a comprehensive list of:

1. Any and all citations and/or violations issued by regulatory agencies and/or judgments against bidder from a court of law.
2. All assessed penalties or liquidated damages, and the project in which they occurred.
3. Any and all contract terminations.
4. A list of all projects worked on over the past three years.
5. A list of the total number of supervisors and workers intended to be assigned to this Project.

The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. The Owner’s decision or judgment on these matters will be final, conclusive, and binding. Conditional bids will not be accepted.

7. BID SECURITY

Bid Deposits shall be submitted in the amount of 5% of the bid price including any potential alternates. The Bid Deposit shall be made payable to the Town of Winchester and shall be either in the form of cash, certified check, treasurer's or cashier's check issued by a responsible bank or trust company, or a bid bond issued by a surety licensed to do business in the Commonwealth of Massachusetts; and shall be conditioned upon the faithful performance by the principal of the agreement contained in the bid.

All bid deposits, except those of the three lowest responsible and eligible bidders, will be returned within ten (10) business days, after the opening of the general bids. The bid deposits of the three lowest responsible and eligible bidders will be returned upon the execution and delivery of the Contract, or if no award is made, upon the expiration of sixty business (60) days, except that, if any bidder fails to perform his agreement to execute a Contract and furnish a Performance Bond and a Labor and Materials Payment Bond as stated in his bid, his bid deposit shall become the property of the Town of Winchester as liquidated damages; provided that the amount of the bid deposit which becomes the property of the Town of Winchester shall not, in any event, exceed the difference between his bid price and the bid price of the next lowest responsible and eligible bidder; and provided further that, in case of death, disability or other unforeseen circumstances affecting the bidder, his bid deposit may be returned.

8. TIME OF COMPLETION

Bidder must agree to commence work on a date to be specified in a written "Notice to Proceed" from the Owner and to substantially complete all work in the roadways by September 4, 2020 and all other work by October 30, 2020 by with the understanding that Work in the street on this project will not commence on site until June 15, 2020.

9. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

- a. It is the responsibility of each bidder before submitting a bid to (1) examine the Bidding and Contract Documents thoroughly; (2) examine the location of the Project to become familiar with local conditions that may affect cost, progress, performance or furnishing of the work; (3) Consider Federal, State, and local laws, regulations, and ordinance that may affect cost, progress and performance of the Work; 4) Notify the Owner of all apparent conflicts, errors, or discrepancies in the Contract Documents.
- b. Before submitting a bid, each bidder will be responsible to make or obtain such explorations, tests, and data concerning physical conditions which may affect cost, progress, performance or furnishing of the Work and which the bidder deems necessary to determine its bid for performing the Work in accordance with the time, price, and the terms and conditions of the Contract Documents. Failure of a bidder to visit the site and acquaint itself with the bidding documents or to attend the pre bid conference, if any, shall in no way relieve the bidder from any obligation with respect to its bid or under the Contract if awarded the bid.

- c. Owner may, at a bidder's request, provide each bidder access to the site to conduct such explorations and tests as such bidder deems necessary for submission of a bid.
- d. The submission of a bid will constitute a representation by the bidder that the bidder has complied with every requirement of the Specification, that without exception the bid is premised upon performing and furnishing the work required.
- e. No claim for any extra monies will be allowed because of unintentional error or conflicts in the Contract Documents.
- f. The failure or omission of any bidder to examine any form, instrument, or document and to fail to be familiar and visit the site will not relieve a successful bidder of the obligation to furnish all material, labor and equipment necessary to carry out the provisions of the Contract.

10. ADDENDA AND INTERPRETATIONS

No oral interpretation of the meaning of the plans, specification or other bidding documents will be made to any bidder. Every request for such interpretation shall be in writing addressed to **Erica Guidoboni, Toole Design, 617-619-9910, or at eguidoboni@tooledesign.com** and, to be given consideration, must be received at least five (5) days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications issued not later than two (2) days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addenda or interpretation shall not relieve such bidder from any obligations under his bid as submitted. All addenda so issued shall become part of the Contract Documents.

11. SECURITY FOR FAITHFUL PERFORMANCE

Simultaneously with his delivery of the executed contract, the Contractor shall furnish a surety bond as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract, as specified in the General Conditions included herein. The surety on such bond or bonds shall be provided by a duly authorized surety company satisfactory to the Owner. The successful general bidder will be required to furnish a Performance Bond and a Labor and Materials Bond, each of which shall be in the amount equal to one hundred percent (100%) of the contract price.

12. POWER OF ATTORNEY

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their powers of attorney.

13. NOTICE OF SPECIAL CONDITIONS

Attention is particularly called to those parts of the Contract Documents and specifications, which deal with the following:

- a. Inspection and testing of materials
- b. Insurance requirements
- c. Wage rates
- d. Non-discrimination in employment
- e. OSHA 10 Certification
- f. CORI Requirements

14. LAWS AND REGULATIONS

The bidder's attention is directed to the fact that all applicable Federal and State laws, municipal bylaws and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract and the Work throughout, and will be deemed to be included in the Contract the same as though herein written out in full.

The award of the Contract is governed by M.G.L. c. 30, § 39M. Certain provisions of this and other applicable statutes are summarized or referred to in the Instructions to Bidders and other Contract Documents. Whenever any of the Contract Documents set forth or summarize applicable statutory provisions, whether or not the statutes have been specifically referred to, such summaries are for convenience only, do not purport to be complete or correct as summaries in any material particular, and shall in no respect supersede, expand or limit rights or duties of the Town or bidders in matters governed by statute.

Minimum rates of wages for work performed under this contract will be as determined by the Division of Occupational Safety of the Massachusetts Department of Labor and Work Force Development in accordance with the provisions of M.G.L. c. 149, §§ 26-27H. Attention is called to serious penalties established under law for violation of these provisions. The schedule of wage rate determinations applicable to this contract is included in the bidding documents.

15. PROTECTION AND RESTORATION OF PROPERTY

The Contractor, in constructing or installing facilities alongside or near sewers, drains, water or gas pipes, electric or telephone conduits, poles, sidewalks, walls or other structures shall, at his expense, sustain them securely in place, cooperating with the officers and agents of the various utility companies and municipal departments which control them so that the services of these structures shall be maintained. He shall also be responsible for the repair or replacement, at his own expense, of any damage to such structures caused by his acts or neglect and shall leave them in the same condition as they existed prior to the commencement of work.

In case of damage to utilities, the Contractor shall promptly notify the Owner and shall, furnish laborers to work temporarily under the Owner's direction in providing access to the utility. Pipes or other structures damaged by the operation of the Contractor may be repaired by the Town of Winchester or by the utility company, which suffers the loss. The cost of such repairs shall be borne by the Contractor without compensation therefore.

It shall be the responsibility of the Contractor to determine location, size, type, etc., of all underground utilities from the Town of Winchester, and utility company concerned and to maintain all utilities in place during construction.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in protecting or repairing property as specified in this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed thereafter.

16. PUBLIC SAFETY AND CONVENIENCE

Attention is directed to the fact that the work on this project is to be performed on properties which are utilized by pedestrians. Contractor shall furnish, install, maintain, and move all warning devices, barricades, signs, flares, bridging materials, special apparel, and other safety measures and controls necessary for the protection of motorists, of pedestrians, and of his own personnel. When, in the judgment of the Owner, construction operations constitute a hazard to traffic in the area, the Contractor may be required to suspend operations during certain hours.

17. SALES TAX

M.G.L. c. 64H, § 6(f) exempts from Massachusetts sales tax building materials and supplies to be used in the Project, and bidders shall not include in their bids any amount therefor. The words "building materials and supplies" shall include all materials and supplies consumed, employed or expended in the construction, reconstruction, alteration, remodeling or repair of any building, structure, public highway, bridge, or other such public work, as well as such materials and supplies physically incorporated therein. Said words shall also include rental charges for construction vehicles, equipment and machinery rented specifically for use on the site of the Project or while being used exclusively for the transportation of materials for the Project. The number of the certificate granted by the Commissioner of Revenue for use in obtaining the exemption will be given to the successful general bidder. Each bidder shall take this exemption into account in calculating its bid, and shall not include any sales tax on its bid.

18. INTEREST OF MEMBERS, OFFICERS, OR EMPLOYEES OF THE OWNER; MEMBERS OF LOCAL GOVERNING BODY, OR OTHER PUBLIC OFFICIALS

No member, officer or employee of Owner, or its designees or agents, no member of the governing body of the locality in which the project is situated, and no other public officials, member, officer or employee of the Owner, or its designees or agents, no members of the governing body of such locality or localities who exercises any functions or responsibilities with respect to the Project during his tenure or for one year thereafter, shall have any interest, direct or indirect, in any agreement, contract or subcontract, or the proceeds thereof, for Work to be performed in connection with the Project. The Contractor shall incorporate or cause to be

incorporated, in all of its agreements, contracts or subcontracts a provision prohibiting such interest pursuant to the purposes of this section.

19. NON-DISCRIMINATION IN EMPLOYMENT

Contract for Work under this proposal will obligate the contractors and subcontractors not to discriminate in employment practices.

Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the Contract.

The successful bidder must be prepared to comply in all respects with the Contract provisions regarding Equal Employment Opportunity.

20. SEPARATE CONTRACTS

- a. The Owner reserves the right to perform construction or operations related to the Project under separate contracts, and/or with the Owners' own forces in connection with other portions of the Project or other construction or operations on the site under separate Contract.
- b. The Contractor shall cooperate fully with separate contractors with regard to storage of materials and execution of separate contract work, and shall connect and coordinate the separate contractors' construction and operations with the Contractor's as required by the Contract Documents.
- c. It shall be the Contractor's responsibility to inspect all separate contractor work affecting the Work and to report to the Owner any irregularities or defects that will not permit completion of the Work in a satisfactory manner.
- d. When results of separate contractors' work depends on proper results for the Contractor's Work, the Contractor shall immediately report to the Owner or Engineer any discrepancies or defects that would be unsuitable for proper execution of the Work.
- e. It shall be the responsibility of the Contractor to measure the completed work in place and report to the Owner immediately any difference between completed work by others and the Drawings.
- f. The Contractor's failure to notify the Owner of such irregularities shall indicate the separate contractors' work has been satisfactorily completed to receive the Work.
- g. The Contractor shall not be responsible for defects in the separate contractors' work of which could not then have been reasonably discovered.

21. CORI

Any persons performing unsupervised work must go through the process of a criminal background check or “CORI.” The bidder awarded the Contract must provide to the Owner a signed CORI release form and a copy of the driver’s license from each and every person who will be working on a site where children are located. The Owner will determine and provide an adequate identification method for approved personnel and reserves the right to refuse access to a school site to any person without this identification without being charged for any service time.

**TOWN OF WINCHESTER
ROADWAY IMPROVEMENTS
MCCALL MIDDLE SCHOOL ROADWAY IMPROVEMENT PROJECT**

From: _____
(Name of Bidder)

To: Town of Winchester (the “Awarding Authority”)

A. The Undersigned proposes to furnish all labor, equipment, tools and materials required for the construction of the **McCall Middle School Roadway Improvement Project** (the “Project”), in accordance with the accompanying Contract Documents and plans and specifications prepared by Toole Design for the contract price specified below, subject to additions and deductions according to the terms of the specifications.

B. The bid includes addenda numbered _____.

C. The proposed maximum contract price is _____
_____ dollars

(\$ _____). Bidder hereby confirms that it has included bid security in the amount of 5% of the proposed contract price made payable to the Town of Winchester.

MCCALL MIDDLE SCHOOL TRAFFIC IMPROVEMENT PROJECT

Unit Price Bid Form

<i>ITEM #</i>	<i>DESCRIPTION OF ITEM</i>	<i>UNIT</i>	<i>ESTIMATED QUANTITY</i>	<i>UNIT PRICE</i>	<i>BID PRICE</i>
1	MOBILIZATION	LS			
2	NPDES STORMWATER PREVENTION PLAN	LS			
3	TEMPORARY PEDESTRIAN MANAGEMENT GUIDANCE SYSTEM INCL. SIGNAGE	LS			
4	TEMPORARY TRAFFIC MANAGEMENT GUIDANCE SYSTEM INCL. SIGNAGE	LS			
5	POLICE DETAIL	HR	560	\$ 57.19	\$ 32,026.40
6	CLEARING AND GRUBBING COMPLETE INCL. REMOVAL FROM SITE	SY			
7	INDIVIDUAL TREE PROTECTION	EA			
8	TREE AND STUMP REMOVED, OVER 6 INCHES	EA			
9	SEDIMENTATION AND EROSION CONTROL	LS			
10	TEST PIT FOR EXPLORATION	EA			
11	DUST CONTROL	LS			
12	EARTH EXCAVATION	SY			
13	MISC. UTILITY MANHOLE, GRATE, FRAME AND COVER ADJUSTED	EA			
14	DRAINAGE STRUCTURE ADJUSTED	EA			
15	DRAINAGE STRUCTURE REMOVED	EA			
16	DRAINAGE STRUCTURE CHANGE IN TYPE	EA			
17	HYDRANT ADJUSTED	LF			
18	REMOVAL OF DRAINAGE STRUCTURE SEDIMENT	LF			
19	PAVEMENT MARKING REMOVAL	SF			
20	FLASHING WARNING PEDESTRIAN BEACON REMOVED AND STOCKPILED	EA			
21	FENCE REMOVED AND RESET	LF			
22	GRAVEL BORROW FOR BACKFILL	LF			
23	CRUSHED STONE	TON			
24	GRANITE CURB REMOVED AND RESET	LF			
25	GRANITE CURB REMOVED AND STOCKPILED	SY			
26	ASPHALT PAVING REMOVED COMPLETE INCL. SAW CUTTING AND DISPOSAL	SY			
27	CONCRETE PAVING REMOVED COMPLETE INCL. SAW CUTTING AND DISPOSAL	SY			
28	CATCH BASIN COMPLETE IN PLACE INCL. FRAME GRATE	EA			
29	AREA DRAIN COMPLETE IN PLACE INCL FRAME AND GRATE	EA			
30	TRENCH DRAIN COMPLETE IN PLACE INCL. FRAME, GRATE	EA			
31	MANHOLE COMPLETE IN PLACE INCL FRAME AND COVER	EA			
32	12 INCH DUCTILE IRON PIPE	LF			
33	12 INCH CORRUGATED PLASTIC (POLYETHYLENE) PIPE	LF			

MCCALL MIDDLE SCHOOL TRAFFIC IMPROVEMENT PROJECT

Unit Price Bid Form

ITEM #	DESCRIPTION OF ITEM	UNIT	ESTIMATED QUANTITY	UNIT PRICE	BID PRICE
34	SIGN POST REMOVED AND RESET	EA			
35	BRICK PAVING REMOVED AND RESET	SF			
36	BRICK PAVING ON ASPHALT BASE COMPLETE IN PLACE	SF			
37	GRANITE CURB CORNER TYPE B	LF			
38	VA4 GRANITE CURB - STRAIGHT COMPLETE IN PLACE	LF			
39	VA4 GRANITE CURB- CURVED COMPLETE IN PLACE	LF			
40	MOUNTABLE GRANITE CURB COMPLETE IN PLACE	LF			
41	GRANITE TRANSITION CURB AT WHEELCHAIR RAMPS - STRAIGHT COMPLETE IN PLACE	LF			
42	GRANITE TRANSITION CURB AT WHEELCHAIR RAMPS - CURVED COMPLETE IN PLACE	LF			
43	HMA FOR PATCHING OF PAVEMENT	TON			
44	HMA FOR JOINT SEALANT AND MISC. WORK	TON			
45	BITUMINOUS ASPHALT SIDEWALK COMPLETE INCL. COMPACTED GRAVEL BASE	SY			
46	EXISTING PAVEMENT MILL AND OVERLAY COMPLETE	SY			
47	BITUMINOUS ASPHALT PAVING COMPLETE ALL COURSES AND COMPACTED GRAVEL BASE INCLUDED	SY			
48	4" CONCRETE SIDEWALK PAVING - COMPLETE COMPACTED GRAVEL BASE INCLUDED	SF			
49	6" CONCRETE PAVING AT DRIVEWAYS - BASE INCLUDED	SF			
50	CONCRETE WHEELCHAIR RAMP	EA			
51	CONCRETE BICYCLE RAMP	EA			
52	TACTILE WARNING STRIP AT WHEELCHAIR AND BICYCLE RAMP	EA			
53	LOAM AND SEED, COMPLETE IN PLACE	SY			
54	THERMOPLASTIC PAVEMENT MARKINGS	LF			
55	ARROWS AND LEGEND REFLECT. THERMOPLASTIC PAVEMENT MARKINGS	SF			
56	PEDESTRIAN AND BIKE SYMBOLS PAVEMENT MARKINGS	EA			
57	SOLAR POWERED RAPID FLASHING BEACON, COMPLETE IN PLACE INCL CONC. BASE AND ALL PARTS AND EQUIPMENT	EA			
58	R1-1 SIGNAGE, ALUMINUM PANEL INCL. ATTACHMENT ASSEMBLY	EA			
59	R9-6 SIGNAGE, ALUMINUM PANEL INCL. ATTACHMENT ASSEMBLY	EA			
60	R9-7 SIGNAGE, ALUMINUM PANEL INCL. ATTACHMENT ASSEMBLY	EA			
61	R10-25 SIGNAGE, ALUMINUM PANEL INCL. ATTACHMENT ASSEMBLY	EA			
62	R10-12 SIGNAGE, ALUMINUM PANEL INCL. ATTACHMENT ASSEMBLY	EA			
63	S1-1 SIGNAGE, ALUMINUM PANEL INCL. ATTACHMENT ASSEMBLY	EA			
64	W11-12 SIGNAGE, ALUMINUM PANEL INCL. ATTACHMENT ASSEMBLY	EA			
65	W16-7PLSIGNAGE, ALUMINUM PANEL INCL. ATTACHMENT ASSEMBLY	EA			
66	CUSTOM SIGNAGE, ALUMINUM PANEL INCL. ATTACHMENT ASSEMBLY	EA			

MCCALL MIDDLE SCHOOL TRAFFIC IMPROVEMENT PROJECT

Unit Price Bid Form

ITEM #	DESCRIPTION OF ITEM	UNIT	ESTIMATED QUANTITY	UNIT PRICE	BID PRICE
67	TRAFFIC SIGN POST COMPLETE IN PLACE	EA			
68	SIGNAL HEAD 1-WAY, 5 SECTION, 12 INCH LENS	EA			
69	STREET LIGHT TYPE I COMPLETE IN PLACE INCL. POLE, CONC. BASE, PULL BOX AND WIRING	EA			
70	STREET LIGHT TYPE II COMPLETE IN PLACE INCL. POLE, CONC. BASE, PULL BOX AND WIRING	EA			
71	MACKIA AMURENSIS 2-2.5" CAL COMPLETE IN PLACE	EA			
72	CERCIS CANADENSIS 2-2.5" CAL, COMPLETE IN PLACE	EA			
73	AMELANCHIER LAEVIS 2-2.5" CAL, COMPLETE IN PLACE	EA			
74	AS-BUILT SURVEY	LS			

Total of All Bid Items (1-74) Basis of Award:

Dollars

in words

in numbers

Deduct Alternate #1 : Deduct Item # 68, Signal Head, 1-way, 5 Section Complete

in numbers

Deduct Alternate #2 : Deduct Item # 69 Street Light Type I Complete, including pole, fixture, bracket arm and associated wiring

in numbers

Deduct Alternate #3 : Deduct Item # 70 Street Light Type II Complete, including pole, fixture and associated wiring

in numbers

Deduct Alternate #4 : Deduct Items # 71-73, all trees, including soil, mulch, staking

Deduct Alternate #5 : Deduct item #36, new brick paving complete, **ONLY** at Waterfield Rd. and Mystic Valley Parkway N/E intersection, replace with 4" concrete complete in place.

in numbers

- D. Bidder accepts all of the terms and conditions of the Advertisement for Bids and Instructions to Bidders.
- E. Bidder promises and agrees that this Bid will remain subject to acceptance for sixty (60) business days after the day of Bid Opening.
- F. The undersigned agrees that, if selected as contractor, he or she will within ten (10) business days, after presentation thereof by the Awarding Authority, execute a contract in accordance with the terms of this bid and furnish a performance bond and a labor and materials or payment bond, each in the form contained in the bidding documents and of a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the Awarding Authority and each in the amount of the contract price, the premiums for which are to be paid by the contractor and are included in the contract price. The undersigned understands and agrees that the bid deposit accompanying this bid shall become the property of the Awarding Authority if the bidder fails to execute such contract or otherwise fails to comply with the terms of this bid.
- G. The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work, and in the specified time described in the bid and contract documents, and that he will comply fully with all laws and regulations applicable to awards made subject to M.G.L. c. 30, § 39M.
- H. The undersigned further certifies under the penalties of perjury that:
1. This bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.
 2. The said undersigned is not presently debarred from doing public construction work in the commonwealth under the provisions of M.G.L. c. 29, § 29F, or any other applicable debarment provision or any rule or regulation.
 3. Bidder has complied with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.
 4. The foregoing bid is based upon the payment to laborers to be employed on the Project of wages in an amount no less than the applicable prevailing wage rates established for the Project by the Massachusetts Department of Labor Standards.
 5. The bidder has complied with the Immigration Reform and Control Act of 1986, as amended, and with all regulations adopted thereunder, with respect to all of its employees who will be performing work under this contract and further certifies that said contractor does not knowingly employ any person in violation of United State immigration laws. Bidder further certifies that it will require a similar

certification to be executed by any subcontractor who will perform work under this contract and will maintain such certifications for inspection by the Awarding Authority upon its request.

- I. By signing and submitting this Form for General Bid, the bidder represents that:
1. Bidder has examined copies of all bidding documents.
 2. Bidder has familiarized itself with the nature and extent of the Contract Documents, Work site, locality, and all local conditions and laws and regulations that in any manner may affect cost, progress, performance or furnishing of the work.
 3. Bidder has studied carefully all reports and drawings of physical conditions included with these specifications, and accepts that all measurements and technical data included herein is the engineer's estimates and the bidder has made such investigations of his own as necessary and has based his bid on those investigations.
 4. Bidder has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, and studies (in addition to or which pertain to the physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work) as bidder considers necessary for the performance or furnishing of the Work at the Contract Price, with in the Contract Time and in accordance with the other terms and conditions of the Contract Documents, and no additional examination, investigations, explorations, tests, reports, or similar information of data are or will be required by bidder for such purposes.
 5. Bidder has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
 6. Bidder has given the Awarding Authority written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof is acceptable to bidder.
 7. Bidder acknowledges that the Awarding Authority has the right to reject any or all bids and to waive informalities in the bidding, if it deems such rejection(s) to be in its best interest.
 8. Bidder represents that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

J. Post-Bid Submittals: If awarded the Contract, the undersigned agrees to furnish, without limitation, the following information prior to the time established for execution of the Contract:

1. Massachusetts Foreign Corporation Certificate, if applicable.
2. OSHA training records for each employee assigned to this project.

K. References: List of all projects of a similar size and scope completed within the last five (5) years, including at least two municipalities for which such work has been performed. Attach additional pages if necessary.

Name of Project	Location	Contact Person	Phone/Email
-----------------	----------	----------------	-------------

1.	_____		
----	-------	--	--

2.	_____		
----	-------	--	--

3.	_____		
----	-------	--	--

4.	_____		
----	-------	--	--

Date of Bid: _____

(Print Name of Bidder)

By: _____
(Signature)

(Print Name of Person Signing Bid and Title)

(Business Address)

(City, State and Zip Code)

Telephone: () _____

Email Address: _____

Social Security Number or Federal Identification Number: ¹ _____

¹ The bidder's Social Security Number and Federal Identification Number will be furnished to the Massachusetts Department of Revenue to determine whether the bidder has met tax filing or tax payment obligations. This request is made under the authority of M.G.L. c. 62C, § 49A.

NOTE: If the bidder is a corporation, indicate state of incorporation, give full names of officers; if a partnership, give full names and addresses of all partners; and if an individual, give residential address if different from business address. Use the following spaces, and additional sheets if necessary:

If a Corporation:

Incorporated in what state:_____

President:_____

Treasurer:_____

Secretary:_____

If a foreign corporation (incorporated or organized under laws other than the laws of the Commonwealth of Massachusetts), is the corporation registered with the Secretary of State of Massachusetts?

Yes _____ No _____

If the bidder is selected for the work referred to above, it is required under M.G.L. c.30 § 39L to furnish to the Awarding Authority a certificate of the Secretary of State stating that the corporation has complied with M.G.L. c. 156D and the date of such compliance.

If a Partnership: (Name all Partners)

Name of Partner:_____

Residence:_____

Name of Partner:_____

Residence:_____

Name of Partner:_____

Residence:_____

If an Individual:

Name:_____

Residence:_____

If an Individual doing business under a firm name:

Name of Firm:_____

Name of Individual:_____

Business Address:_____

Residence:_____

If other form of business organization, please provide attachment describing the form of organization and the name of officers or partners therein.

CERTIFICATION OF COMPLIANCE WITH TAX LAWS OF COMMONWEALTH

I certify under the penalties of perjury that I, to my best knowledge and belief have filed all State tax returns and paid all State taxes required under law.

*Signature of Individual or Corporate Name (Mandatory)

By: _____
Corporate Officer (Mandatory, if Applicable)

**Social Security Number (Voluntary) or Federal Identification Number

* Approval of a Contract or other Agreement will not be granted unless this Certification Clause is signed by the applicant.

** Your Social Security or Tax ID number will be furnished to the Massachusetts Department of Revenue to determine whether you have met tax filing or tax payment obligations. Providers who fail to correct their non-filing or delinquency will not have a Contract or other Agreement issued, renewed, or extended. This request is made under the authority of Mass General Laws c. 62C s. 49A.

CERTIFICATION

INTERNAL ACCOUNTING

The Contractor certifies that it has internal accounting controls as required by Chapter 30, Section 39R, and that the Contractor will:

1. Maintain accurate and detailed accounts for a six year period after the final payment;
2. File regular statements of management concerning internal auditing controls;
3. File an annual audited financial statement; and
4. Submit a statement from an independent certified public accountant that such CPA has examined management's internal auditing controls and expresses an opinion as to their consistency with management's statements in (2) above and whether such statements are reasonable with respect to transactions and assets that are substantial in relation to designer's financial statements. G.L. Chapter 7, Section 301(e).

Signed under the pains and penalties of perjury:

Name of Company: _____

Authorized Signature: _____

NOTE: This form is to be completed only when the contract exceeds \$100,000 and is for the purchase of materials or for the construction, renovation, etc., of public works or public buildings.

TO: Town of Winchester, Massachusetts

RE:

To whom it may concern:

Please be advised that I have reviewed the statement on internal accounting controls prepared by/for _____ (name of company), in connection with the above captioned project. This statement is required under Massachusetts General Laws, Chapter 30, Section 39R. In my opinion, representations of management are consistent with our evaluation of the system of internal accounting controls. In addition, I believe that they are reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the firm's financial statements.

Yours sincerely,

Certified Public Accountant

NOTE: This form is to be completed only when the contract exceeds \$100,000 and is for the purchase of materials or for the construction, renovation, etc., of public works or public buildings.

**CONTRACT BETWEEN THE TOWN OF WINCHESTER
AND
XXXXXXX
FOR
MCCALL MIDDLE SCHOOL TRAFFIC IMPROVEMENT PROJECT**

This Contract is made and entered into this _____ day of _____ by and between _____, a corporation duly organized by law and having a usual place of business at _____, the (“Contractor”), and the Town of Winchester, Massachusetts (the “Owner”).

WHEREAS, the Owner issued an Advertisement for Bids for the **McCall Middle School Traffic Improvement Project** (the “Project”), dated _____; and

WHEREAS, the Contractor represents that it is duly qualified in this field, and has bid and offered to do all the work as required by the Owner for the Project; and

WHEREAS, the Owner has accepted the Contractor’s bid, subject to the conditions of this Contract.

NOW, THEREFORE, it is agreed by and between the Owner and the Contractor, as follows:

1. GENERAL

1.1 **CONTRACT DOCUMENTS** –The Contract comprises the following documents, including all additions, deletions and modifications incorporated therein before the execution of the Contract: Legal and Procedural Documents, Advertisements for Bids, Instructions to Bidders, all Bidding Documents, Contract Forms, this Contract, Specifications, Drawings, General and Sub-Bid Forms, Certificates of Bidders, Labor and Materials Payment Bond and Performance Bond, Prevailing Wage Rates, all addenda issued prior to execution of the contract, other documents listed and referenced throughout, and any Modifications validly issued after execution of the Contract.

1.2 **MODIFICATION** – A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work. No oral order, objection, claim or notice by any party to the others shall affect or modify any of the terms or obligations contained in any of the Contract Documents, and none of the provisions of the Contract Documents shall be held to be waived or modified by reason of any act whatsoever other than by a definitely agreed waiver or modification thereof in writing.

1.3 **THE CONTRACT** –The Contract Documents represent the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract Documents may be amended or modified only by a Modification. Nothing contained in the Contract Documents shall be construed to create any contractual relationship (1) between the Engineer and the Contractor, (2) between the Owner or

the Engineer and a Subcontractor or (3) between any persons or entities other than the Owner and the Contractor.

1.4 **THE WORK** – The term “Work” means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

1.5 **THE PROJECT** – The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner or by separate contractors.

1.6 **THE DRAWINGS** – The Drawings are the graphic and pictorial portions of the Contract Documents, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

1.7 **THE SPECIFICATIONS** – The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards, and workmanship for the Work, and performance of related services.

1.8 **WORK HOURS** - Construction shall be conducted only between 7:00 a.m. and 6:00 p.m. weekdays, and 9:00 a.m. and 5:00 p.m. Saturdays. No construction is permitted on Sundays or holidays except where permitted by state law, in which case construction shall be permitted only between 9:00 a.m. and 5:00 p.m.

2. CONTRACT SUM

2.1 Payments under this Contract shall not exceed _____ Dollars (the “Contract Sum”). The Contractor’s Schedule of Values will be utilized for the Contractor’s Payment Requests but shall only be so utilized after it has been approved in writing by the Engineer, and the Owner.

2.2 The Contract Sum is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

3. EXECUTION, CORRELATION AND INTENT

3.1 The Contractor shall perform all the Work required by this Contract in conformity with the plans and specifications contained and referenced herein. No willful and substantial deviation from said plans and specifications shall be made unless authorized in writing by the Owner.

3.2 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents. The Contractor shall have a continuing duty to read, examine, review, compare and contrast each of the Contract Documents, shop drawings, and other submittals throughout the Work and shall give written notice to the Owner of any conflict, ambiguity, error or omission which the Contractor may find with respect to these documents before proceeding with the affected portion of the Work. The

express or implied approval by the Owner or the Engineer of any shop drawings or other submittals shall not relieve the Contractor of the continuing duties imposed hereby, nor shall any such approval be evidence of the Contractor's compliance with this Contract. The Town has requested the Engineer to only prepare documents for the Project, including the plans and specifications for the Project, which are accurate, adequate, consistent, coordinated and sufficient for construction. However, the Town makes no representation or warranty to the Contractor concerning such documents.

3.3 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contractor shall provide and pay for, but not limited to, for the completion of the Work, all materials, labor, tools, construction equipment and machinery, water, heat, utilities, light, power, transportation, superintendence, temporary construction, fire protection, ventilation, enclosures of every nature, safety equipment, snow and ice removal and all other services and facilities of every nature whatsoever necessary to execute, complete and deliver the Work in accordance with the Contract Documents. The permanent heating and ventilation systems may, with the prior written approval of the Owner, be used for these purposes when available unless otherwise prohibited in the Contract Documents.

3.4 Any Work performed after regular working hours, on Saturdays, Sundays or legal holidays, shall be performed without additional expense to the Owner.

3.5 The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall include all Work incidental or reasonably inferable from the Contract Documents as being necessary to produce the intended results under the Contract Documents. All Work mentioned or indicated in the Contract Documents shall be performed by the Contractor as part of this Contract unless it is specifically indicated in the Contract Documents that such Work is to be done by others.

3.6 Anything shown on the Plans and not mentioned in the Specifications, or mentioned in the Specifications and not shown on the Plans, shall have the same effect as if shown or mentioned respectively on both.

3.7 Neither party shall take advantage of any obvious error or omission in the Contract Documents. Any apparent discrepancies shall be submitted to the Owner for determination. The decision of the Owner thereupon shall be conclusive.

3.8 The fact that specific mention of a fixture, or of any part of the work is omitted in the Specifications, whether intentionally or otherwise, when the same is clearly shown or indicated on the Plans, or is usually and customarily required to complete fully such work as is specified herein, shall not entitle the Contractor to consider action in the manner of any claim for extra compensation, but the said fixtures or work, or both, must be installed or done the same as if called for by both the Plans and Specifications.

3.9 In case of any inconsistency or conflict among the Contract Documents or within any of the Contract Documents, the Contract Documents shall be interpreted on the basis of the following priorities, with the later date of documents in each category to take precedence:

1. Modifications

2. Change Orders
3. Construction Change Directives
4. Engineer's supplemental instructions
5. This Contract
6. Addenda
7. Advertisement for Bids and Instructions to Bidders
8. Drawings and Specifications

Further, in case of any conflict, discrepancy, or inconsistency among any of the following Contract Documents, the following shall control:

1. as between figures given on plans and scaled measurements the figures shall govern;
2. as between full size plans and reduced size plans, the full size plans govern;
3. as between plans and specifications, the requirements of the specifications shall govern;
4. as between this document and specifications, this document shall govern.

3.10 If any provision contained in this Contract or the application thereof to any person or circumstance shall, for any reason or to any extent, be held to be invalid, illegal or unenforceable in any respect, all other provisions hereof, as well as the application of the affected provision to persons or circumstances other than those as to which it is held invalid, illegal or unenforceable, shall not be affected thereby, and shall be construed and enforced to the fullest extent permitted by law as if such invalid, illegal or unenforceable provision had never been included herein; it being intended that each of the provisions of this Contract shall be severable.

3.11 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade, except the Contractor shall not divide the work of any filed sub-bid trade, bids for which have been received separately by the Owner in accordance with M.G.L. c. 149. The Contractor and all Subcontractors shall refer to all of the Drawings, and to all of the Sections of the Specifications, and shall perform all Work reasonably inferable as being necessary to produce the indicated results.

3.12 Any discrepancies found between the Drawings and Specifications and site conditions or any errors or omissions in the Drawings or Specifications shall be immediately reported to the Owner, who shall promptly correct such error or omission in writing. Any work done by the Contractor after discovery of such discrepancies, errors or omissions without notifying the Owner shall be done at the Contractor's risk.

3.13 Further instruction may be issued by the Owner during the progress of the work by means of Drawings or oral or written instructions to make more clear or specific the Drawings and Specifications or as may be necessary to explain or illustrate changes in the work to be done. The Contractor shall carry out the work in accordance with the additional Drawings and Instructions.

3.14 Unless otherwise stated in the Contract Documents, words and abbreviations that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

3.15 Where public or private standard specifications, codes, regulations, ordinance and similar publications of governmental agencies, technical societies, manufacturer's associations and regulatory groups or bureaus are referred to in these specifications, the applicable portion thereof shall be of the same effect as if fully printed herein, and the work done in full accordance therewith. The edition current as of the date of issue of this specification shall be used except where publication date is specifically stated.

3.16 Where no quality or standards for materials or workmanship are established, such Work is to be of good quality for the intended use and consistent with the quality of the surrounding Work and of the Construction of the Project.

3.17 Any Test boring or soil test information included in the Contract Documents or made available to the Contractor are not represented by the Owner nor the Engineer as an accurate or approximate indication of subsurface conditions, and no claim for extra costs or extensions of time resulting from reliance by the Contractor on such information shall be allowed except to the extent required by law.

3.18 All of the Contract Documents prepared and copies provided by the Owner and the Engineer are the property of the Owner. The Contractor, Subcontractor, Sub-subcontractor, or material or equipment supplier shall not use the Contract Documents for any other projects without written authorization of the Owner.

4. OWNER

4.1 The Owner, sometimes referred to as the Awarding Authority, the Town of Winchester, or the Town, is the Town of Winchester, Massachusetts, and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. The Owner's representative shall, for the purposes of this Contract be the Owner's Town Engineer. The term "Owner" means the Owner or the Owner's authorized representative.

4.2 The Owner and agents of the Owner shall have access to and be permitted to inspect all Work, materials, payrolls, records of personnel, invoices of materials and other relevant data and records whenever these are in progress of preparation. The Contractor shall provide proper and necessary facilities for such access and inspection. For the purpose of observing work that affects their respective properties, inspectors for public agencies and the utility companies shall be permitted access to the Work, but all official orders and directives to the Contractor will be issued only by the Owner.

4.3 In the event that the Contractor covers, conceals or obscures its work in violation of this Contract or in violation of a directive from the Owner or the Engineer, such work shall be uncovered and displayed for the Owner's or Engineer's inspection upon request, and shall be reworked at no cost in time or money to the Owner.

4.4 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, such copies of Drawings, Project Manuals, and Specifications as are reasonably necessary for execution of the Work. Information or services required of the Owner hereunder shall be furnished by the Owner with reasonable promptness after receipt from the Contractor of a written request for such information or services.

4.5 The Owner shall not be responsible for furnishing surveys or other information as to the physical characteristics of, legal limitations of or utility locations for the project site. Contractor shall confirm the location of each utility, shall excavate and dispose of each on-site utility and shall cap each off-site utility as required by the Work, any applicable law, and as may be included in the Specifications.

4.6 Owner does not warrant nor assume responsibility whatsoever the accuracy or sufficiency of borings made, or logs of test borings, or other investigations, or the interpretations therefrom, and no warranty or guaranty, express or implied, that the conditions indicated by such investigation, borings, logs, or information are representative of existing conditions throughout the project site, or that unforeseen developments may not occur. At the Owner's request, the Contractor shall make available the results of any site investigation, test borings, analysis, studies or other tests conducted by or in possession of the contractor or any of the Contractors agents.

4.7 The Contractor represents that it is familiar with the Project site and has received all information required concerning the conditions of the Project Site. The Contractor represents that it has inspected the locations of the subsurface conditions. The Contractor shall undertake further investigations and studies as may be necessary to determine surface and subsurface conditions. Based on these inspections and understandings, agreements and acknowledgements, the Contractor agrees that (1) the Contract Sum is just and reasonable compensation for all of the Work, including all foreseeable risks, hazards, difficulties in connection therewith, (2) that the deadlines for completion of work and the Work under the Contract Documents are feasible to achieve, and (3) that the Work shall not result in any lateral or vertical movement of any structure. The Contractor shall, except to the extent required by law, have no claims for surface or subsurface conditions encountered. The Contractor shall exercise care in executing subsurface Work in proximity of known subsurface utilities, improvements, and easements.

4.8 The Owner shall be liable to the Contractor only to the extent of its interest in the Project, and no officer, official, employee, board member, consultant, volunteer participant or agent of the Owner shall ever be personally or individually liable with respect to this Contract or the Work. Each Subcontract shall include the foregoing limitation, which shall be effective if the Owner ever succeeds to the Contractor's rights and obligations under a Subcontract.

5. OWNER'S RIGHT TO STOP WORK AND/OR CARRY OUT THE WORK

5.1 If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents or fails to carry out the Work in accordance with the Contract Documents, the Owner by immediate written order signed personally or by its authorized agent, may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.

5.2 Alternatively, if the Contractor fails, defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the Engineer at the Owner's direction to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies, perform the Work using its own forces or hire one or more contractors to correct such deficiencies. In such case, an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the Owner's and the Engineer's additional services and expenses made necessary by such default, neglect, or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

5.3 The Owner shall have the right to suspend the work or any portion thereof at any time for a period less than fifteen (15) days without charge or cost by the Contractor for time delay provided that the Owner gives the Contractor written notice of suspension of work. The Contractor shall resume the work upon written notice from the Owner and for a period less than fifteen (15) days after the date set forth in the notice of suspension.

5.4 In the event of temporary suspension of work or during inclement weather or whenever the Owner shall direct the Contractor and will cause subcontractors to protect carefully all the work and materials against damage or injury from the weather. If, in the opinion of the Owner any work or materials shall have been damaged or injured from the weather, by reason of failure on the part of the Contractor or any of the Contractor's subcontractors so to protect the work, such materials shall be removed and replaced at the expense of the Contractor.

5.5 The Owner shall have the authority to direct the Contractor not to correct work that has been damaged, or that was not performed in accordance with the Contract Documents. An equitable deduction from the Contract Amount shall be made to compensate the Owner for such uncorrected work. Such deduction shall be made whether or not final payment has been made under this Contract.

5.6 Owner's rights and remedies under this Article 5 shall be in addition to, and no in lieu of, any other rights and remedies it may have under this Contract or any applicable law.

6. SEPARATE CONTRACTS

6.1 The Owner reserves the right to perform construction or operations related to the Project under separate contracts, or with the Owner's own forces in connection with other portions of the Project or other construction or operations on the site under separate Contract.

6.2 The Contractor shall cooperate fully with separate contractors with regard to storage of materials and execution of separate contract work, and shall connect and coordinate the separate contractor's construction and operations with the Contractor's as required by the Contract Documents.

6.3 It shall be the Contractor's responsibility to inspect all separate contractor work affecting the Work and to report to the Owner any irregularities or defects that would not permit completion of the Work in a satisfactory manner or in the time permitted in the Contract Documents.

6.4 The Contractor shall immediately report to the Owner or Engineer any discrepancies or defects in a separate contractor's work that would be unsuitable for proper execution of the Work. The Contractor's failure to notify the Owner of such irregularities shall indicate the separate contractor's work has been satisfactorily completed to receive the Work.

6.5 It shall be the responsibility of the Contractor to measure the completed work in place and report to the Owner immediately any difference between completed work by others and the Drawings.

6.6 The Contractor shall not be responsible for defects in the separate contractors work which could not then have been reasonably discovered by the Contractor.

6.7 Wherever work being done by the Owner's forces or by other contractors is contiguous to Work covered by the Contract, the respective rights of various interests involved shall be established by the Owner, to secure the completion of the various portions of the work in general harmony.

7. ENGINEER – ADMINISTRATION OF THE CONTRACT

7.1 The Engineer is the person or entity licensed to practice or engineering, who is responsible for performing the duties assigned to the Engineer by the Contract Documents.

7.2 The Owner, at the Owner's sole discretion, shall assume the responsibilities and role of the Engineer when an Engineer has been deemed unnecessary by the Owner for completion of the Work.

7.3 The Engineer's responsibilities and authority shall not take precedence over the Owner's rights and the Contractors obligations to fulfill the Contract Document requirements as set forth in the Contract Documents.

7.4 Except as otherwise provided in the Contract Documents or when direct communications have been specifically authorized by the Owner, the Owner and Contractor shall communicate through the Engineer. Communications by and with the Engineer's consultants shall be through the Engineer. Communications by and with subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contract contractors shall be through the Owner.

7.5 The Engineer shall provide administration of the Contract as described in the Contract Documents, and will be the Owner's representative during construction, until final payment is due and at the Owner's request, from time to time during the guaranty period. The Engineer will advise and consult with the Owner.

7.6 The Engineer will regularly visit the site, conduct job meetings, and keep the Owner informed of the progress and quality of the Work, and will endeavor to inform the Owner of defects and deficiencies in the Work. The Engineer's minutes of meetings shall be the official minutes kept on the Project. However, the Engineer will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Engineer will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or

procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as otherwise expressly provided herein.

7.7 Based on the Engineer's observations and evaluations of the Contractor's Applications for Payment, the Engineer will review and certify the amounts due the Contractor and will submit to the Owner for its review, consideration, and, if approval of Certificates for Payment in such amounts as the Engineer determines appropriate in accordance with the Contract Documents.

7.8 The Engineer shall reject Work that does not conform to the Contract Documents. Whenever the Engineer considers it necessary or advisable to achieve the intent of the Contract Documents, the Engineer will have authority to require additional inspection or testing of the Work.

7.9 The Engineer will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking such submittals for conformance with the information given and the design concept expressed in the Contract Documents. The Engineer's review shall be in accordance with the provisions and the procedures described in the Contract Documents and shall not relieve the Contractor from compliance with the requirements of the Contract Documents.

7.10 The Engineer will prepare Change Orders and Construction Change Directives for the Owner's approval and execution. The Engineer may authorize Minor Changes in the Work.

7.11 The Engineer will conduct inspections to determine, in consultation with the Owner, the date or dates of Substantial Completion and the date of Final Completion, will receive and forward to the Owner for the Owner's review and records written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.

7.12 The Owner may provide one or more project representatives to assist in carrying out the Engineer's responsibilities at the site.

7.13 The Engineer will interpret and decide matters concerning performance under and requirements of the Contract Documents on written request of either the Owner or Contractor. The Engineer's written response to such requests will be made within time limits that will not affect the progress of the Work, but, in any event, within a thirty (30) day limit.

7.14 The Engineer's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents, subject to approval by the Owner.

7.15 The Owner may utilize the services of a Clerk of the Works for the Project. Except as authorized by the Owner, the Clerk of the Works shall have no authority for approvals or changes to the Work. The Owner's Clerk of the Works shall be on site at all times during regular working hours as defined in the Contract Documents. If the Contractor determines the need for additional hours outside of the regular working hours and receives authorization and, any required permits to perform work outside of the regular working hours, the Contractor shall be responsible for the additional costs associated with the Clerk's required services to be on site at all times during those

hours not regular hours as identified in the Contract Documents. The reimbursement shall be based on the Clerk of the Works' hourly wage and benefits and shall be paid by means of a credit Change Order executed at the time of Final Completion.

8. CONTRACTOR

8.1 The Contractor is the person or entity identified as such in the Contract and is referred to throughout the Contract Documents as if singular in number. The Contractor shall designate in writing a representative who shall have the express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

8.2 Prior to starting Work and at frequent intervals during the progress, the Contractor shall carefully study and compare the Contract Documents with each other and with the information furnished by the Owner or Engineer and shall at once report to the Owner and Engineer any error, inconsistency or omission the Contractor may discover. If the Contractor proceeds with the Work without such notice to the Engineer, having discovered such errors, inconsistencies or omissions, or if by reasonable study of the Contract Documents the Contractor could have discovered such, the Contractor shall bear all costs arising therefrom.

8.3 The Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing activities. Errors, inconsistencies or omissions discovered shall be immediately reported to the Owner and the Engineer.

8.4 The Contractor shall perform the Work in accordance with the Contract Documents.

8.5 Any claim by the Contractor or subcontractors that, in submitting their bid proposals, they did not include all items as shown in the Contract Documents, will be given no consideration for an adjustment. If any item is specified in a Section which would not normally furnish these items it shall be the responsibility of the Contractor to coordinate the situation with the Subcontractor, and if the item under consideration is not to be provided by the Subcontractor it shall be the responsibility of the Contractor to provide the work in question, without any additional cost to the Owner.

8.6 The Contractor shall begin and shall prosecute the work regularly, and without interruption after Notice to Proceed has been given by the Owner (unless otherwise directed in writing by the Owner) with such force as to secure the completion of the work, in an acceptable manner, within the time stated in the Proposal.

8.7 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordination of all portions of the Work. Where Contract Documents refer to particular construction means, methods, techniques, sequences or procedures or indicate or imply that such are to be used in the Work, such mention is intended only to indicate that the operations of the Contractor shall be such as to produce at least the quality of work implied by the operations described, but the actual determination of whether or not the described operations may be safely and suitably employed on the Work shall be the responsibility

of the Contractor, who shall notify the Owner and Engineer in writing of the actual means, methods, techniques, sequences or procedures which will be employed on the Work, if these differ from those specified in the Contract Documents. All loss, damage, or liability, or cost of correcting defective work arising from the employment of any construction means, methods, techniques, sequences or procedures shall be borne by the Contractor, notwithstanding that such construction means, methods, techniques, sequences or procedures are referred to, indicated or employed by the Contract Documents, unless the Contractor has given timely notice to the Owner and Engineer in writing that such means, methods, techniques, sequences or procedures are not safe or suitable, and the Owner has then instructed the Contractor in writing to proceed with such means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor.

8.8 The Contractor shall be responsible to the Owner for the acts and omissions of the Contractor's employees, agents, Subcontractors and suppliers and the employees and agents of any of the foregoing, and any other entities or persons performing or supplying the Work.

8.9 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Engineer in the Engineers administration of the Contract, the activities or duties of an Owner's Project Manager (if any), or by tests, inspections or approvals required or performed by persons other than the Contractor.

8.10 The Contractor shall be responsible for inspection of portions of Work already performed under this Contract to determine that such portions are in proper condition to receive subsequent work.

8.11 The Contractor shall exercise due care when working around all property bounds. Should any damage to a bound result from the actions of the Contractor, it shall be replaced and/or realigned by the Contractor as directed by the Owner. No further compensation will be due to the Contractor for the materials and labor required to re-establish the bound in its proper orientation.

8.12 The Contractor shall give all notices and comply with all Federal, State and local laws, ordinances and regulations in any manner affecting the conduct of the Work, and all such orders and decrees as exist, or may be enacted by courts, agencies, bodies or tribunals having any jurisdiction or authority over the Work.

8.13 The Contractor shall be responsible for the conduct and discipline of employees and/or any subcontractor or persons employed by subcontractors. All workers must have sufficient knowledge, skill and experience to perform properly the work assigned to them. Any foreperson or worker employed by the Contractor or subcontractor who, in the opinion of the Owner, does not perform the work in a skillful manner or appears to be incompetent or to act in a disorderly or intemperate manner shall, at the written request of the Owner and to the extent permitted by law, be discharged immediately and shall not be employed again in any portion of the Work without the approval of the Owner.

9. SUPERINTENDENCE

9.1 The Contractor shall employ a competent Project Manager and Superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work and until the date of Substantial Completion and for such additional time thereafter as the Owner

may determine to be necessary for the full completion of the Work. The Superintendent shall be responsible for coordinating all the Work of the Contractor and the Subcontractors.

9.2 The Contractor shall remove the project manager or superintendent or assistants if requested to do so in writing by the Owner, and shall promptly replace such person with a competent person reasonably acceptable to the Owner. The Superintendent shall represent the Contractor, and communications given to the Superintendent shall be as binding as if given to the Contractor.

9.3 The Superintendent shall be licensed consistent with the Massachusetts Building Code. The Superintendent's resume shall be submitted to the Owner prior to commencement of construction and must demonstrate to the Owner's reasonable satisfaction that the Superintendent has performed similar duties on previous construction projects similar to the Project.

9.4 The Contractor shall retain a competent registered professional engineer or registered land surveyor, acceptable to the Owner, who shall establish the exterior lines and required elevations of all buildings and structures to be erected on the site and shall establish sufficient lines and grades for the construction of associated work such as, but not limited to, roads, utilities and site grading. Said engineer or land surveyor shall certify as to the actual location of the constructed facilities in relation to property lines, building lines, easements, and other restrictive boundaries.

9.5 The Contractor shall conduct the engineering required for establishing grades, lines, levels, dimensions, layouts, and reference points for the trades; shall be responsible for maintaining bench marks and other survey marks; and shall replace any bench marks or survey marks which have been disturbed or destroyed.

9.6 The Contractor shall coordinate and supervise the Work performed by all Subcontractors to the end that the Work is carried out without conflict between trades and so that no trade causes delay to the general progress of the Work. The Contractor and all subcontractors shall at all times afford each trade, any separate contractor, or the Owner, every reasonable opportunity for the installation of Work and the Storage of materials.

9.7 The Contractor shall arrange for and attend job meetings with the Owner and the Engineer and such other persons as the Owner and the Engineer may require to be present. The Contractor shall be represented by a principal, the project manager, the superintendent, or other representative of the Contractor acceptable to the Owner. An authorized representative of any Subcontractor shall attend such meetings if the representative's presence is requested by the Owner or the Engineer.

10. SUBCONTRACTORS

10.1 A subcontractor, also referred to in the Contract Documents as a filed-subcontractor or sub-subcontractor, is a person or entity that has a direct contract with the Contractor or another Subcontractor to perform a portion of the Work. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

10.2 By written agreement, the Contractor shall require each subcontractor to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by those Contract Documents, assumes toward the Owner and the Engineer. The Contractor shall make available to each Subcontractor, prior to the execution of a subcontract agreement, copies of the Contract Documents to which the subcontractor will be bound, and shall further identify to the Subcontractor any terms and conditions of the subcontract agreement which may differ or be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors. The Owner shall have the right to review the Contractor's standard form of subcontract and the content of all subcontracts and sub-subcontracts.

10.3 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner provided that the assignment is effective only after termination of the Contract by the Owner for cause and only for those subcontract agreements which the Owner, in its sole discretion, accepts by notifying the Subcontractor and Contractor in writing. Such assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract. In the event of such assignment to and assumption by the Owner, the Subcontractor shall have no claim against the Owner or such third party for Work performed by such Subcontractor or other matters arising prior to termination of the Contract, and the Owner or such third party, as the case may be, shall be liable only for obligations to the Subcontractor arising after such assumption. This Section 9.3 shall serve as the instrument of assignment at such time as the assignment provided for above becomes effective. The Contractor agrees to include in each subcontract agreement the assent of each Subcontractor to such assignment of its subcontract agreement to the Owner, and to execute whatever instruments the Owner may request to confirm the assignment described in this Section 9.3.

10.4 The Contractor, as soon as practicable after award of the Contract, shall provide in writing to the Owner and Engineer the names of persons or entities, and business address (including those who are to furnish materials or equipment fabricated by a special design) proposed for each principal portion of the Work, or as specifically requested by the Owner or Engineer. The Engineer shall reply to the Contractor in writing stating whether or not the Owner has reasonable objection to any such proposed person or entity, the Owner shall not object to previously approved sub-bidders. Neither the Contractor nor the Subcontractor shall contract with a person or entity to which the Owner has made reasonable objection.

10.5 The applicable provisions of Massachusetts law shall apply to all subcontractors filed sub-contractors and sub-subcontractors and said law shall take precedence over any conflicting statements in the Contract Documents.

11. NOTIFICATIONS

11.1 Written notice shall be considered as served when delivered in person or sent by certified mail or courier service providing proof of delivery to the individual, firm or corporation or the last business address known to that person who serves the Notice. It shall be the duty of each party to advise the other parties to the Contract as to any change in business address upon completion of the Contract.

12. CONTRACT SECURITY

12.1 The Contractor shall furnish and maintain in force a labor and materials payment bond and a performance bond in an amount not less than one hundred percent (100%) of the Contract Sum as security for the performance of the Contract and payment of all persons performing labor on the project under this Contract and furnishing materials in connection with this Contract.

12.2 The sureties of all bonds shall be such surety company or companies as are approved by the Owner, and as are authorized to transact business in the Commonwealth of Massachusetts. An attorney-in-fact who executes the required bonds for the surety shall affix a certified and current copy of the power of attorney.

12.3 If at any time the Owner, for justifiable cause, shall be or become dissatisfied with any surety or sureties, the Contractor shall within five (5) days after notice from the Owner to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished such an acceptable bond to the Owner.

12.4 The Contractor may list in its bid that any or all filed Subcontractors provide the Contractor with payment and performance bonds for the full 100% amount of the Subcontract. The costs for said bonds shall be the responsibility of the Contractor. Requirements relating to the Contract Security and Payment and Performance Bonds throughout the Contract Documents shall be applicable to the bonds and surety provided by the Subcontractors, for which verification, payment, and responsibility shall be with the Contractor.

12.5 In the event the Contractor lists in its bid that filed Subcontractors provide bonds, and subsequently waives the requirement, the Contractor shall provide the Owner with a certification that they understand if the filed subcontractor defaults or is terminated, the Contractor accepts full responsibility and costs related to said default or termination with a credit change order in an amount equal to the bond premium it would have paid had it required the filed Subcontractor to provide such bonds.

13. INDEMNIFICATION

13.1 The Contractor shall indemnify, defend with counsel acceptable to the Owner, and save harmless the Owner, the Engineer, and their officers, agents, servants and employees from and against any and all claims, demands, suits, proceedings, liabilities, judgments, awards, losses, damages, costs and expenses, including attorneys' fees, on account of bodily injury, sickness, disease or death sustained by any person or persons or injury or damage to or destruction of any property, directly or indirectly arising out of, relating to or in connection with the Work or any breach or failure of the Contractor to comply with the terms and conditions of the Contract Documents, whether or not due or claimed to be due in whole or in part to the active, passive or concurrent negligence or fault of the Contractor, the offices, agents, servants or employees and/or any other person or persons, and whether or not such claims, demands, suits or proceedings are just, unjust, groundless, false or fraudulent; and the Contractor shall and does hereby assume and agrees to pay for the defense of all such claims, demands, suits and proceedings. Such obligation

shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person.

13.2 If a separate contractor sues or initiates an arbitration proceeding against the Owner on account of any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor who shall defend such proceedings at the Contractor's expense, and if any judgment or award against the Owner arises therefrom the Contractor shall pay or satisfy it and shall reimburse the Owner for all attorneys' fees and court or arbitration costs which the Owner has incurred.

13.3 This Article shall survive the expiration or termination of this Contract.

14. INSURANCE

14.1 The Contractor shall not commence work under this Contract until the Contractor has obtained the following insurance coverage and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on the subcontract until all similar insurance required of the subcontractor has been so obtained and approved. Approval of the insurance by the Owner shall not relieve or decrease the liability of the Contractor hereunder. Certificates from the Contractor's Insurance carriers stating the coverage's provided, the limits of liability and expiration dates shall be filed with the Owner before operations are started.

1. Workmen's Compensation Insurance: Procure and maintain during the life of this Contract, Workmen's Compensation and Employer's Liability Insurance as required by State law for all employees to be engaged in work at the site of the project, and, in case of any such work sublet, Contractor shall require subcontractors similarly to provide Workmen's Compensation and Employer's Liability Insurance for all the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's Insurance. The limit of liability for Employer's Liability Insurance shall be not less than \$500,000.00. In case any class of employees engaged in hazardous work on the project under this Contract is not protected under the Workmen's Compensation Statute, the Contractor shall provide and shall cause each Subcontractor to provide Employer's Liability Insurance with a limit of at least \$1,000,000 for each accident for the protection of such of employees as are not otherwise protected.
2. Contractor's General Liability and Property Damage Insurance: Procure and maintain during the life of this Contract, comprehensive Contractor's General Liability Insurance, with the Owner additional named insured, covering bodily injury, including accidental death, with limits of \$1,000,000 per person, \$1,000,000 per occurrence and property damage insurance with limits of \$1,000,000 per occurrence, including products and completed operations, explosion, collapse, (X/C/U) and Broad Form Property Damage Coverage. Provide a separate policy for completed operations for a period of two (2) years from date of Final Completion of the Project. Any policy issued shall include permission for partial or total occupancy by Owner within the scope of this Contract. Coverage shall also include an Owner's and Contractor's protective liability favoring the Owner and an

umbrella of excess liability in the amount of \$2,000,000 (two million dollars) minimum.

3. Contractor's Automobile Liability Insurance: Procure and maintain during the life of this Contract Comprehensive Automobile Liability Insurance, including all owned, non-owned, and hired automobiles, with the Owner as additional named insured, covering bodily injury, including accidental death, with limits of \$1,000,000 per person, \$1,000,000 per occurrence and property damage with limits of \$1,000,000 per occurrence.
4. All-risk Insurance: Procure and maintain during the life of this Contract All-Risk Builder's Risk Insurance on a 100% completed value basis, with the Owner named as an insured as the Owners interests may appear. In the event of paid claims, the Contractor shall bear the costs of any amounts deductible under the policy.
5. Property Insurance: Procure and maintain during the life of this Contract Property Insurance in the amount of the Contract Sum, and subsequent modifications to include all components, portions, and full coverage of the Work including Boiler and Machinery Insurance at the site on a replacement cost basis. Property insurance shall include portions of the Work stored off site or in transit. The Insurance shall include interests of the Owner, the Contractor, and Subcontractors and sub-subcontractors in the Work.

14.2 All such insurance shall be provided by a Best 'A' rated company lawfully authorized to do business in the Commonwealth of Massachusetts. The Owner shall be named as an additional insured under all policies. In the event of paid claims under all policies the Contractor shall bear the cost of all and any deductibles. The Insurance Policies shall not conflict with the Contract Documents and shall allow for the Owner's partial or total occupancy by Owner within the scope of the Contract Documents.

14.3 Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of the Contract and shall operate as an immediate termination thereof.

14.4 All policies shall be so written that the Owner will be notified in writing of cancellation or restrictive amendment at least thirty (30) days prior to the effective date of such cancellation or material amendment. Renewal certificates must be furnished by the Contractor prior to the expiration date of any of the initial insurances.

14.5 If a loss occurs under any of the insurance policies required by the Contract Documents, insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear. The Contractor shall pay Subcontractors their shares of insurance proceeds received by the Contractor, and by agreements, written where legally required for validity, and shall require Subcontractors to make payments to their sub-subcontractors.

15. PERMITS AND FEES

15.1 The Contractor shall secure any and all permits, licenses, and fees required for the proper execution of the Work. The Contractor shall coordinate all efforts required to obtain said permits.

15.2 If the Contractor observes that portions of the Contract Documents are at variance with any permit conditions, the Contractor shall promptly notify the Engineer and Owner in writing, and necessary changes shall be accomplished by appropriate Modification.

15.3 If the Contractor performs Work knowing it to be contrary to any permit or license condition, or any laws, statutes, ordinances, building codes, and rules and regulations without such notice to the Engineer and Owner, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs.

16. TAXES

16.1 The Contractor shall not pay, and the Owner shall not reimburse or pay the Contractor for, any sales taxes on building supplies or materials for which an exemption is provided pursuant to M.G.L. c. 64H, § 6(f).

17. ASSIGNMENT

17.1 Neither the Contractor nor the Owner shall sublet, sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or the right, title or interest therein, or the obligations hereunder, without written consent of both the Contractor and the Owner. If the Contractor attempts to make such assignment, the Contractor shall nevertheless remain legally responsible for all obligations under the Contract.

18. TIME

18.1 The Contractor agrees that time is of the essence of each and every portion of the Contract Documents and wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract an additional time is allowed for the completion of any Work, the new time limit fixed by such extension shall be of the essence of this Contract.

18.2 The date of commencement of the Contract shall be **April 30, 2020** unless otherwise fixed in a Notice to Proceed from the Owner. Work will commence in the street on **June 15, 2020**.

18.3 The Contractor shall notify the Owner at least five days prior to starting the Work. The Contractor shall coordinate the Work and proceed with adequate forces and shall be required to obtain Completion within the time set in the Contract Documents.

18.4 Prior to commencement of the Work, the Contractor shall meet in conference with representatives of the Owner and Engineer to discuss and develop mutual understandings relative to administration of the quality assurance program, safety program, labor provisions, the schedule of Work, and other Contract procedures.

18.5 The date of Substantial Completion is the date certified by the Engineer and approved by the Owner. The Contractor shall achieve Substantial Completion of the entire Work no later than 76 days from the commencement date of the Contract.

18.6 The Contractor shall achieve Final Completion of all work in the street by September 4, 2020 and the entire Work no later than October 30, 2020.

18.7 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Engineer, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by other causes that the Engineer determines may justify delay, then, by Change Order, the Contract Time may be extended for such reasonable time as the Owner determines, and the Contract Sum shall be adjusted by the amount of the actual, direct, increased costs incurred by the Contractor during such extended time; provided, however, that the Contractor shall not be entitled to an extension of time due to an act or neglect of the Owner or the Engineer unless the Contractor has first provided timely written notice to the Owner and the Engineer that the act or neglect of the Owner or Engineer, as applicable, is adversely affecting the commencement or progress of the Work.

18.8 Change Order Requests for Extension of Time based on seasonal variations in the weather shall be denied. Conditions of the weather are solely at the risk of the Contractor.

18.9 Failure to notify the Engineer in writing of any delay shall preclude the Contractor from subsequently claiming any damages due to said delay.

18.10 Notwithstanding the above, the following provisions of G.L. c. 30, § 39O shall govern, where applicable:

Chapter 30: Section 39O. Contracts for construction and materials; suspension, delay or interruption due to order of awarding authority; adjustment in contract price; written claim

Section 39O. Every contract subject to the provisions of section thirty-nine M of this chapter or subject to section forty-four A of chapter one hundred forty-nine shall contain the following provisions (a) and (b) in their entirety and, in the event a suspension, delay, interruption or failure to act of the awarding authority increases the cost of performance to any subcontractor, that subcontractor shall have the same rights against the general contractor for payment for an increase in the cost of his performance as provisions (a) and (b) give the general contractor against the awarding authority, but nothing in provisions (a) and (b) shall in any way change, modify or alter any other rights which the general contractor or the subcontractor may have against each other.

(a) The awarding authority may order the general contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the awarding authority; provided however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any

profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.

(b) The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim.”

18.11 It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the date of beginning and the time for completion as specified in the Contract Documents of the Work are Essential Conditions of this Contract; and it is further mutually understood and agreed that the Work shall be commenced on a date to be specified in the Contract Documents or a Notice to Proceed.

18.12 The Contractor agrees that said Work shall be prosecuted regularly, diligently and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for the completion of the Work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

18.13 If the said Contractor shall neglect, fail or refuse to complete the Work within the time herein specified, or any proper extensions thereof granted by the Owner, that the Contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the sum of \$500, not as a penalty but as liquidated damages for such breach of contract as herein set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents for completing the work.

18.14 The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain. The Contractor and/or the Contractor's surety shall be liable for and pay the Owner the sums stipulated as liquidated damages. These liquidated damages are not intended to limit the liability of the Contractor for actual damages that may exceed the amount of these liquidated damages.

19. CONTRACTOR'S CONSTRUCTION SCHEDULES

19.1 At least fifteen (15) days prior to commencement of the Work the Contractor shall submit to the Engineer a construction schedule in bar graph form, satisfactory to the Engineer, showing in detail the proposed progress for the construction of the various parts of the Work, the proposed times for receiving materials required, and the interrelationship between the various construction

operations and the percentage of completion and the dollar value of the completed work on the first day of each month for each section of the specifications and the entire Work. Submission of said schedule shall be a condition precedent to approval of the Contractor's first application for payment.

19.2 At the end of each month, or more often if required, the Contractor shall furnish the Engineer an updated schedule showing actual progress of the various parts of the Work in comparison with the originally proposed progress and payment schedules. If the Engineer raises any objections to progress or payment schedules submitted by the Contractor, the Contractor shall immediately address and resolve such objections to the reasonable satisfaction of the Engineer.

19.3 Whenever progress of the Work falls behind the planned schedule of construction as shown on the project schedule, the Contractor shall promptly notify the Owner and the Engineer and promptly advise the Owner of action being taken to return the Work to the planned schedule or to revise the schedule as necessary to maintain the Substantial Completion date, and such action shall be indicated on the project schedule, which shall then be promptly re-submitted by the Contractor to the Engineer and the Owner for review and approval.

19.4 If the Owner determines that the progress of the Work has been materially delayed, or that the project schedule is in jeopardy of not being met, the Owner shall have the right to require the Contractor to take whatever steps are necessary to recover all or a portion of such delay. If and to the extent such delay is caused by any act or omission of the Owner or the Engineer or is otherwise beyond the control of the Contractor, the costs of such recovery shall be borne by the Owner; otherwise the costs associated with such recovery shall be borne by the Contractor and there shall be no increase in the Contract Sum on account of such recovery activities. The Contractor shall, within three (3) days after the Owner's request to take such action, notify the Owner and the Engineer in writing, and commence implementing the steps the Contractor proposes to take to effect such recovery, and provide the Owner, in a form acceptable to the Owner, a detailed recovery schedule setting forth the actions to be taken by the Contractor. If the Contractor disputes any direction given by the Owner pursuant to this paragraph, it shall have no right to refuse to accelerate the Work, but the Contractor shall have the right to make a Claim for additional costs in accordance with the provisions of the Contract Documents. Notwithstanding anything in this Contract to the contrary, if the Contractor fails or refuses to accelerate the Work after its receipt of the Owner's direction to do so, the Contractor shall be liable to the Owner for the Owner's actual damages incurred or accruing on each day the Contractor fails to recover, beginning on the date on which the Owner directed the Contractor to accelerate. Nothing herein shall limit any other rights or remedies that the Owner may possess under other provisions of the Contract Documents or by law.

19.5 If the Contractor submits a construction schedule that anticipates Substantial Completion before the date established in the Owner's Notice to Proceed, the Contractor shall have no claim for additional compensation on account of any delays that prevent Substantial Completion before the date set in said Owner's Notice to Proceed.

19.6 The Owner's approval of any submission of a schedule or a schedule update shall be limited to a determination that the schedule or update represents a reasonable plan for completion of the Work within the Contract Time, and such approval, or lack thereof, shall not limit or modify any

of the Contractor's obligations under the Contract Documents. The Contractor shall comply with the schedule most recently approved by the Owner.

19.7 The Contractor shall prepare and keep current for the Engineer's approval, a schedule of submittals which is included in the Contractor's construction schedule and allows the Engineer reasonable time to review submittals.

20. SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

20.1 The Contractor shall submit to the Engineer samples required in the Contract documents or as required by the Owner or Engineer for approval. Samples shall be furnished so as not to delay fabrication, allowing the Owner reasonable time for the consideration of the samples submitted. Contractor shall furnish such samples of materials, and workmanship shall be in accordance with approved samples.

20.2 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, manufacturer, supplier, or distributor to illustrate a portion of the Work.

20.3 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor or its Subcontractors and suppliers to illustrate materials or equipment for some portion of the Work.

20.4 Samples are physical examples which illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged.

20.5 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. The purpose of their submission is to demonstrate for those portions of the Work for which submittals are required the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

20.6 The Contractor shall review, approve, and submit to the Engineer Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals made by the Contractor which are not required by the Contract Documents may be returned without action. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Engineer without action. The Contractor's attention is directed to the provisions of "Or Equal" Submissions/Substitutions of the Specifications.

20.7 The Contractor shall prepare and keep current, for the Engineer's approval, a schedule of submittals which is coordinated with the Contractor's construction schedule and allows the Engineer reasonable time to review submittals.

20.8 The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Engineer. Such Work shall be in accordance with approved submittals.

20.9 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified field construction criteria, materials, field measurements, quantities, relations to existing Work, coordination with Work to be installed later, coordination with information on previously accepted Shop Drawings, Product Data, Samples, or similar submittals and verification of compliance with all of the requirements of the Contract Documents. The accuracy of all such information is the responsibility of the Contractor. In reviewing Shop Drawings, Product Data, Samples, and similar submittals the Owner and Engineer shall be entitled to rely upon the Contractor's representation that such information is complete and accurate.

20.10 The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Engineer's or Owner's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Owner and Engineer in writing of such deviation at the time of submittal and the Owner has given explicit written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals by the Engineer's or Owner's actions.

20.11 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Engineer on previous submittals.

20.12 Informational submittals upon which the Engineer is not expected to take responsive action may be so identified in the Contract Documents.

20.13 When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the Engineer shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

21. "OR EQUAL" SUBMISSIONS/SUBSTITUTIONS

21.1 Except where a product has been specified as a proprietary material, the words "or approved equal" are understood to follow the name of any maker, vendor, or product specified to be used in the Contract Documents. To determine if the materials or articles proposed by the Contractor are equal to those specified, the Engineer shall determine whether the materials or articles proposed are at least equal in quality, durability, appearance, strength and design to the material or articles named or described, and will perform at least equally the functions imposed by the design for the Work; and conforms substantially, even with deviations, to the detailed requirements for the items as described in the Specifications.

21.2 If the Contractor proposes to use a material or item of equipment which, while suitable for the intended use, deviates in any way from the detailed requirements of the Contract Documents, the Contractor shall inform the Engineer in writing of the nature of such deviations at the time the material or item of equipment is submitted for approval, and shall request written approval of the deviation from the requirements of the Contract Documents.

21.3 By making requests for substitutions, the Contractor:

1. represents that it has personally investigated the proposed substitute product and determined that it meets the conditions specified in Section 20.1;
2. represents that it will provide the same warranties and guarantees for the substitute product that it would for that specified;
3. certifies that all cost data presented with respect to the proposed substitution are accurate and complete and include all related (direct and indirect) costs under the Contract, and waives all claims for additional costs related to the substitution that subsequently become apparent; and
4. will coordinate the installation of the substitute, if approved, making such changes as may be required for the Work to be complete in all respects.

21.4 In requesting approval of deviations or substitutions, the Contractor shall provide, upon request, evidence leading to a reasonable certainty that the proposed substitution or deviation will meet the conditions set forth in Section 21.1. If, in the opinion of the Engineer, the evidence presented by the Contractor does not provide a sufficient basis for such reasonable certainty, the Engineer may reject such substitution or deviation without further investigation.

21.5 The Engineer will not approve as equal to materials or equipment specified proposed substitutions which, in the Engineer's opinion, would be out of character, obtrusive, or otherwise inconsistent with the character or quality of design of the Project. In order to permit coordinated design of color and finishes the Contractor shall, if required by the Engineer, furnish the substituted material in any color, finish, texture, or pattern which would have been available from the manufacturer(s) originally specified, at no additional cost to the Owner.

21.6 Any additional cost, or any loss or damage arising from the substitution or proposed substitution of any material, equipment or method for those originally specified shall be borne by the Contractor, including, without limitation, the Owner's and Engineer's costs in evaluating substitutions whether or not approved, costs of any structural, mechanical or other changes necessary to accommodate substituted materials or equipment, and costs of modifying design documents and other additional design fees, notwithstanding approval or acceptance of such substitution by the Owner or the Engineer, unless such substitution was made at the written request or direction of the Owner or the Engineer. If any approved substitution results in a cost savings, the Owner shall be entitled to a credit, reducing the Contract Sum, in an amount equal to the net reduced cost of the substituted material or equipment after taking into account such related costs.

22. SAMPLES AND TESTS

22.1 Materials to be used in the Work may be tested or inspected after reasonable notice by the Engineer and may be rejected. Except as otherwise provided in the Contract, all the cost of testing of material that fail the criteria shall be borne by the Contractor. If the Contractor requests permission to use a material that was not specified in the Contract Documents and the Engineer requires testing of such material before approving its use, the Contractor shall pay for such testing.

22.2 The source of material proposed by the Contractor shall be designated in time to permit all required testing and inspection before the material is needed for incorporation into the Work. The Contractor shall have no claim for delays due to testing if the Contractor fails to designate the proposed source or to order the material in time to provide for adequate testing and inspection. Necessary arrangements shall be made to permit the Engineer to make factory, shop, or other inspection of materials or equipment ordered for the Work, in process of manufacture or fabrication, or in storage elsewhere than the site of the Work.

22.3 The Contractor shall furnish the Engineer with samples of the materials it proposes to use in the execution of the work in sufficient time to afford the Engineer the opportunity to adequately review and, if necessary, arrange for testing of such materials.

23. DOCUMENTS AND SAMPLES AT THE SITE

23.1 The Contractor shall maintain at the site of the Work for the Owner one record copy of this Contract and of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to record field changes and selections made during the construction, and one record copy of approved Shop Drawings, Product Data, Samples, and similar submittals. These shall be available to the Engineer and Owner and shall be delivered to the Engineer for submittal to the Owner upon completion of all the Work of the Project. The Contractor shall be responsible for assuring that the progress of the Work and all revisions are delineated on record Drawings by the specific trades involved on a current basis. The Owner and the Engineer shall have access to such as-built Drawings at all times. When final as-built Drawings are found by the Engineer to be complete, the Contractor shall furnish to the Engineer the record set of "as-built" Drawings in hard copy reproducible format with each sheet clearly marked "Record Drawing" and dated, and Specifications reflecting the actual conditions of the Work, together with a copy of such as-built plans on diskette in the AutoCAD format or such other format as the Owner may require. Delivery by the Contractor of the final as-built Record Drawings shall be a condition to final payment, and furnishing of the Record Drawings may be carried on the punchlist with a value determined by the Owner.

24. USE OF SITE – DELIVERY AND STORAGE OF MATERIALS

24.1 The right of possession of the premises and the improvements made thereon by the Contractor shall remain at all times in the Owner. The Contractor shall confine the Contractor's apparatus, storage of materials, and operations of Contractor's workmen to limits indicated by law, ordinances, Contract Documents, permits, and directions of the Owner and shall not unreasonably encumber the premises. The Owner shall not be liable to the Contractor, the Subcontractors, their employees or anyone else with respect to the conditions of the premises.

24.2 Notwithstanding the designation of contract limits or the indication of temporary fences or barricades, the provisions of the Contract Documents governing certain phases or portions of the Work may require that certain operations be carried out beyond such designated limits. Such Work, if required beyond such designated limits, shall be scheduled in such a manner as to cause a minimum of inconvenience or disturbance to or interference with the normal operations of the Owner, abutters and the public. The Contractor shall obtain the Owner's prior approval and all necessary approvals from abutters, public authorities and utility companies for such operations,

prosecute such operations expeditiously and restore the affected area to its original condition immediately upon completion of such operations, unless otherwise specified in the Contract Documents. All existing walkways, roadways, paved or landscaped areas disturbed by construction or over which temporary driveways or walkways are rerouted shall be restored to their original condition, immediately upon completion of the related phases or portions of the Work, unless otherwise specified in the Contract Documents.

24.3 Materials and equipment shall be progressively delivered to the site so that there will be neither delay in the progress of the Work nor an undue accumulation of materials that are not to be used within a reasonable time.

24.4 Materials stored off-site shall be stored at the expense of the Contractor in a manner that preserves their quality and fitness for the Work. Material shall be placed on wooden platforms or other hard clean surfaces and not on the ground and shall be properly protected.

24.5 If the Contractor requests the Engineer's inspection of materials stored off-site, the Contractor shall assume the Engineer's reasonable costs for travel, room, and meals associated with such inspection.

24.6 Materials stored either at the site or at some other location agreed upon in writing shall be located so as to facilitate prompt inspection and may again be inspected prior to their use in the Work.

24.7 The Contractor shall take charge of and be liable for any loss of or injury to the materials delivered at or in the vicinity of the place where the Work is being done and shall notify the Engineer as soon as any such materials are so delivered and allow them to be examined by the Engineer.

24.8 The Contractor shall provide the Owner and Engineer access to the Work in preparation and progress wherever located.

25. CUTTING AND PATCHING

25.1 The Contractor shall do all necessary cutting and patching of the work that may be required to properly receive the work of the various trades or as required by the Drawings and Specifications to complete the Work. The Contractor shall restore all such cut or patched work as directed by the Owner. Cutting of existing structure that shall endanger the Work, adjacent property, workers or the public shall not be done unless approved and directly supervised by the Owner.

25.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

26. PROTECTION AND RESTORATION OF PROPERTY

26.1 The Contractor shall not enter upon private property for any purpose without obtaining permission, and shall be responsible for the preservation of all public property, trees, monuments, and signs, along and adjacent to the street or right-of-way, and shall use every precaution necessary to prevent damage or injury thereto.

26.2 The Contractor is solely responsible for the proper and safe operation and maintenance of all utility systems within the construction limits, whether these are supplied by the Owner's distribution system or otherwise, until the Work is accepted by the Owner, and until the Owner has notified the Contractor that other arrangements have been made. The Contractor shall maintain and operate appurtenances within the construction area, which serve the distribution system, subject to periodic inspection by the Owner's operating personnel. Inspection by any representative or personnel of the Owner shall not relieve the Contractor of responsibilities in connection with operation and maintenance of these facilities and equipment. The Contractor shall notify the Owner's representatives at least 72 hours in advance of the desire to extend, connect, disconnect, turn on or off any steam, electric, water or other service from the authorized representatives of the Owner. All plumbing, heating, and electrical work, including installation of equipment and any other Work to be performed by the Contractor, shall be carried out without interference with the Owner's normal operation. Where any Work requires interruption of any service, the Contractor shall make advance arrangements with the Owner for dealing with such interruption.

26.3 The Owner will supply to the Contractor all water and electricity reasonably required for all construction requirements. Utilities furnished by the Owner will be discontinued if, in the opinion of the Owner, they are wastefully used. In such event, the Contractor shall supply thereafter all water and electricity required to complete the Work. The Contractor shall supply all hoses, extension cords and other tools necessary for the proper installation of the Work.

26.4 Adequate toilet facilities for use during construction will be supplied by the Owner. The Contractor shall leave sanitary facilities as clean as they were at the start of the Work.

26.5 The Contractor shall provide adequate facilities to keep the Site secure at all times when the Contractor's personnel are not present, from commencement of the Work until Substantial Completion, to assure that the Work, all materials and equipment stored at the Site, and all other property of the Owner located within the site limits or within other areas occupied or controlled by the Contractor, are fully and completely protected against loss or damage due to vandalism, theft, malicious mischief, pilferage or unexplained disappearance. If the Contractor fails to comply with the requirements of this Subsection 25.5, then the Owner may provide appropriate security, and charge the cost thereof to the Contractor. The Owner's provision of such security, or failure to do so, shall not relieve the Contractor of its sole responsibility to pay for loss or damage to such property due to vandalism, theft, malicious mischief, pilferage or unexplained disappearance, to the extent not covered by the Owner's insurance.

26.6 The Contractor shall arrange for and provide all police details required by the Town of Winchester Police Department to be present at or adjacent to the site for traffic control purposes.

The cost of police details so required shall be borne by the Contractor and is included in the Contract Sum.

26.7 The Contractor shall take all other necessary precautions and be responsible for any requirements and fees associated with adequate protection and safety of the site during construction and completion of all contract work, if necessary, to include temporary fencing, signs, barriers, in accordance with the Massachusetts State Building Codes, federal regulations, and local bylaws.

26.8 The Contractor shall keep the Owner's property free at all times from accumulations of waste materials or rubbish and shall remove from the Owner's property, and from all public and private property, all temporary structures, rubbish and waste materials resulting from the operation or caused by the employees, and shall remove all surplus materials resulting from the operation or caused by the employees, leaving the site smooth, clean and true to line and grade. If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor for its costs associated therewith.

26.9 The Contractor shall at the termination of this Contract, before acceptance of the work by the Owner, remove all of equipment, tools and supplies from the property of the Owner. Should the Contractor fail to remove such equipment, tools and supplies, the Owner shall have the right to remove and dispose of them, and the Contractor shall pay all costs incurred by the Owner in removing and disposing of them. The Owner shall not be responsible for storing or maintaining such items not properly removed or disposed of from the site.

27. SUBSURFACE INVESTIGATIONS

27.1 If, during the progress of the Work, the Contractor or the Owner discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the Contract Documents, either the Contractor or the Owner may request an equitable adjustment in the contract price of the contract applying to Work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a Contractor, or upon its own initiative, the Owner shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the Contract Documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and Contract documents and are of such a nature as to cause an increase or decrease in the cost of performance of the Work or a change in the construction methods required for the performance of the Work which results in an increase or decrease in the cost of the Work, the Owner shall make an equitable adjustment in the contract price and the contract shall be modified in writing accordingly.

27.2 The Drawings and Specifications indicate all utilities at and adjacent to the site of which the Owner is aware. However, the Owner makes no representation or warranty that pipes, conduits, lines or other structures or equipment of public and private utility companies ("utility equipment") shown on the Drawings or referred to in the Specifications are the only utility equipment that may be encountered. Prior to commencing Work, the Contractor shall visit the site

and to the extent possible shall confirm the existence and location of all utility equipment and shall, during the course of the Work, make diligent and continuous efforts to confirm the locations of all utility equipment at and adjacent to the site. The Contractor shall promptly notify the Engineer in writing, prior to commencing affected portions of the Work, of any utility equipment that the Contractor discovers and that has not been identified on the Drawings. If and as directed by the Engineer, the Contractor shall make necessary arrangements with utility companies for the protection, alteration or relocation of utility equipment necessary in connection with performance of the Work, and shall notify all municipal departments and utility companies concerned of the time and location of any work which may affect them. The Contractor shall be responsible for all costs and all claims, damages and liabilities arising directly or indirectly from any damage to utility equipment or any intentional or unintentional interruption of service occurring in connection with the Work or other operations of the Contractor.

28. DISPOSAL AND HAZARDOUS MATERIALS

28.1 The Contractor shall dispose of any and all debris, waste, and soils, outside of the limits of the Town of Winchester, including any and all material transported from the project site for disposal. The Contractor shall handle, remove, and dispose of hazardous and chemical waste in accordance with all applicable laws. The Contractor shall make all arrangements and obtain any approvals necessary for said disposal from the owners or officials in charge of the applicable disposal sites and shall bear all cost, including fees resulting from such disposal, including tipping fees. Garbage shall be removed daily.

28.2 No open fire shall be permitted on site without the Owner's prior written permission.

28.3 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. The term "Hazardous Materials" shall include "hazardous materials" as defined in M.G.L. c. 21E and "hazardous substances" as defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980 and the Superfund Amendments and Reauthorization Act of 1986, 42. U.S.C. Section 9601 et seq., as all such laws and statutes have been amended, and regulations promulgated pursuant to such laws and statutes.

28.4 The Contractor shall promptly remedy at its own expense damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under this Section 27, except damage or loss attributable to acts or omissions of the Owner or Engineer or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable. The foregoing obligations of the Contractor are in addition to the Contractor's obligations elsewhere in the Contract Document.

28.5 The Owner shall not be responsible for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall

be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

28.6 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under this Section 28, except to the extent that the cost and expense are due to the Owner's fault or negligence.

28.7 The Contractor shall install weather protection and provide adequate heat in the protected area from November 1 to March 31, at a minimum, as required by M.G.L. c.149, §44G.

28.8 Damages to materials in place or stored such as, but not limited to, deterioration, loss of material life cycle length, shrinkage, staining, warping, cracks, caused by inadequate Site and Weather Protection shall be immediately replaced at the Owner's or Engineer's request at the Contractor's expense.

28.9 The Contractor shall at all times protect excavations, trenches, buildings and materials, from rain water, ground water, backup or leakage of sewers, drains and other piping, and from water of any other origin and shall remove promptly any accumulation of water. The Contractor shall provide and operate all pumps, piping and other equipment necessary to this end.

28.10 The Contractor shall remove snow and ice which might result in damage or delay.

29. QUALITY OF MATERIAL

29.1 The Contractor warrants to the Owner and Engineer that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly submitted, approved, and authorized may be considered defective. If required by the Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

29.2 The Engineer may reject materials if the Engineer reasonably determines that such materials do not conform to the Contract Documents. No rejected materials, the defects of which have been subsequently corrected, shall be used in the Work except with the written permission of the Owner. No extra time shall be allowed for completion of the Work due to the rejection of non-conforming materials.

29.3 The Engineer's inspection of the Work shall not relieve the Contractor of any of its responsibilities to fulfill the Contract obligations, and defective work shall be corrected. Unsuitable work may be rejected by the Owner, notwithstanding that such work and materials have been previously accepted for payment. If the Work or any part thereof shall be found defective at any time before the final acceptance of the whole Work, the Contractor shall forthwith correct such defect in a manner satisfactory to the Engineer, and if any material brought upon the site for use in the Work, or selected for the same, shall be rejected by the Engineer as unsuitable or not in conformity with the Contract requirements, the Contractor shall forthwith remove such materials from the vicinity of the Work.

29.4 Nothing in this Contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the Work or the site of the Project; but all such materials shall, upon being so attached or affixed, become the property of the Owner.

29.5 All items having any apparent historical or archaeological interest which are discovered in the course of any construction activities shall be carefully preserved and reported immediately to the Owner and the Engineer for determination of appropriate actions to be taken. The Owner shall be the final decision factor in determination of items of historical or archaeological interest and may or may not take possession of said items, without charge or costs to the Owner.

30. WORK HOURS AND RATES

30.1 No laborer, worker, mechanic, foreperson or inspector working within this Commonwealth in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or part of the Work contemplated by the contract, shall be required or permitted to work more than eight hours in any one day or more than forty-eight (48) hours in any one week, or more than six (6) days in any one week, except in cases of emergency.

30.2 Every employee under this contract shall lodge, board and trade where and with whom he elects, and neither the Contractor nor his agents or employees shall, either directly or indirectly, require as a condition of the employment of any person that the employee shall lodge, board or trade at a particular place or with a particular person.

30.3 The Contractor shall pay to any reserve police officer employed by him in any city or town the prevailing rate of wage paid to regular police officers in such city or town.

30.4 It is the obligation of the Contractor to assure that the Contractor and all of its subcontractors comply with the requirements of the Massachusetts Prevailing Wage Law, MGL c. 149 §26-27H. The Contractor shall be responsible for all loss, cost and damage suffered or incurred by the Owner as a result of any stop work order or other enforcement action taken by the Attorney General under the authority of MGL c.149 §27, and shall release, indemnify, hold harmless and defend the Owner, the Engineer, their officers, employees and consultants, from and against all claims, actions, suits, fines, or administrative proceedings arising out of or related to the violation by the Contractor or any subcontractor of the said Prevailing Wage Law (or, in the case of the Contractor's defense obligation, the claimed violation thereof). Unless otherwise expressly provided in the Contract Documents, all payroll records required to be submitted to the Owner shall be delivered to a designated employee of the Owner, and not to the Engineer. Minimum wage rates have been determined by the State and/or Federal Labor Department and the Contractor in payment of wages shall be bound by such schedules in the performance of the Work herein provided in the Contract Documents.

30.5 There shall be paid each laborer or mechanic of the Contractor or subcontractor engaged in the Work on the project under this Contract in the trade or occupation listed in the Prevailing Wage Rate sheets, not less than the hourly wage rate set opposite the same, regardless of any contractual relationship which may be alleged to exist between the Contractor or any subcontractor and such laborers and mechanics.

30.6 When both the State and Federal Wage Rate schedules are applicable to the Project, the contractor shall pay the higher of the two Wage Rates in the trade or occupation listed and provide the required certifications, statements of compliance, and weekly payroll reporting forms required for both the State and Federal wage rate paid.

30.7 Any laborer or mechanic employed to perform work on the project under this Contract, which work is not covered by any of the listed classifications, shall be paid not less than the minimum rate of wages specified herein for the classification which most nearly corresponds to the work to be performed, and such minimum wage rates shall be retroactive to the time of initial employment of such persons in such classification.

30.8 The scheduled wage rates are minimum rates only, and the Owner will not consider any claims for additional compensation made by the Contractor because of payment by the Contractor of any wage rate in excess of those specified in this Contract.

30.9 Except as may be otherwise required by law, all claims and disputes pertaining to the classification of labor employed on the project under this Contract shall be decided by the Owner.

30.10 The Contractor shall post at appropriate conspicuous points on the site of the Project a schedule showing all determined minimum wage rates for the various classes of laborers and mechanics to be engaged in work on the project under this Contract and all deductions, if any, required by law to be made from unpaid wages actually earned by the laborers and mechanics so engaged.

30.11 The Contractor agrees that, in case of underpayment of wages to any worker under this Contract by the Contractor or subcontractors, the Owner may withhold from the Contractor out of payment due, an amount sufficient to pay such worker the difference between the wages required to be paid under this contract and the wages actually paid such worker for the total number of hours worked and that the Owner may disburse such amount so withheld by it for and on account of the Contractor to the employee to whom such amount is due. The Contractor further agrees that the amounts to be withheld pursuant to this paragraph may be in addition to the percentages to be retained by the Owner pursuant to other provisions of this Contract.

31. REPORTS, RECORDS AND DATA

31.1 The Contractor and each of the contractors subcontractors shall submit to the Owner such schedules of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this Contract.

31.2 The Contractor and each subcontractor shall prepare payrolls on forms satisfactory to and in accordance with instructions to be furnished by the Owner. Each such payroll shall show, among other things, the total number of persons and of that number the total number of minority persons, on the payroll at skilled, semi-skilled and unskilled classifications employed by the Contractor or the subcontractor (as the case may be) upon the work covered by their Contract, the amount of each payroll and total man-hours worked for each such indicated grouping. The Contractor shall submit weekly to the Owner two certified copies of all payrolls of the Contractor and of the subcontractor. The certification with respect to each such payroll shall affirm that the payroll is correct and complete, that the wage rates contained therein for laborers and mechanics

are not less than those applicable to such laborers and mechanics pursuant to this Contract, and that the classifications set forth for each laborer or mechanic conform with the work performed. The payroll records of the Contractor and each subcontractor covering all laborers and mechanics employed upon the Work shall be maintained during the course of the Work and preserved for a period of three years thereafter. Such payroll records shall contain the name and addresses for each such employee, the correct classification, rate of pay, daily or weekly number of hours worked, deductions made and actual wages paid. The Contractor and each subcontractor shall make all employment records with respect to persons employed by the work covered by this Contract available for inspection by the Owner. The Owner shall be permitted to interview employees of the Contractor or any subcontractor during working hours on the job without claims of delay by the Contractor or subcontractor to the Owner.

32. CHANGES IN THE WORK

32.1 All changes in the work, including any increase, decrease, or other equitable adjustment in the Contract Sum or in the time for performing the Contract, shall be authorized in the form of one, or a combination of, the following written instruments: Change Order, Construction Change Directive, or a Minor Change in the Work. The term "equitable adjustment" as used in this paragraph shall include all adjustments to the Contract Sum or time to which the Contractor or the Owner is entitled pursuant to M.G.L. c.30 §§39N and 39O and such equitable adjustment shall be made in accordance with the provisions of this Article.

32.1.1 A Minor Change is a written order binding on the Contractor issued by the Engineer, with the concurrence of the Owner, not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. The Contractor shall carry out such written orders promptly.

32.1.2 A Change Order is a written instrument prepared by the Engineer and signed by the Owner, Contractor, and Engineer, stating their agreement regarding a change in the work, including a change in the Contract Sum or Contract Time, without invalidating the Contract.

32.1.3 A Construction Change Directive is a written order prepared by the Engineer and signed by the Owner, and Engineer, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum, or Contract Time, or both. The Owner may, by Construction Change Directive, and without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted by Change Order, accordingly.

32.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Engineer; a Construction Change Directive requires agreement by the Owner and the Engineer and may or may not be agreed to by the Contractor; an order for a Minor Change in the Work may be issued by the Engineer with the concurrence of the Owner.

32.3 Change Orders and Construction Change Directives must be counter-signed by the Owner in order to be effective. When Change Orders and/or Construction Change Directives increase the cost of the Work, no obligation shall be incurred without a duly executed Purchase Order, issued and approved, in the amount of such increase.

32.4 Upon request of the Owner or the Engineer, the Contractor shall, without cost to the Owner, submit to the Engineer and the Owner, in such form as the Engineer may require, a "Change Proposal" including a full description of the character and scope of work involved in any proposed extra Work or change in the Work, an accurate written estimate of the cost of such proposed change including all elements of pricing in appropriate detail, and an explanation of the impact of the proposed change on the construction schedule. The cost estimate shall indicate the quantity and unit cost of each item of material or other product and the number of hours of Work and hourly rate for each class of labor, as well as the description and amounts of all other costs chargeable under the terms of this article. If required by the Engineer or the Owner, in order to establish the exact cost of new Work added or of previously required Work deleted, the Contractor shall obtain and furnish to the Engineer bona fide proposals (on letterhead) from Subcontractors, Sub-subcontractors or recognized suppliers for furnishing labor and materials included in such Work, including the same supporting information. The Contractor shall promptly revise and resubmit such cost estimate if the Engineer or the Owner determines that it is not in compliance with the requirements of this article, or that it contains errors of fact or mathematical errors. The Contractor shall state in the Change Proposal any extension of the Contract Time that the Contractor believes is necessary if the change or extra Work is ordered or that the Contractor believes it is entitled to for any other reason. If the Contractor claims an extension of the Contract Time, the Contractor shall provide in the Change Proposal a full explanation of the need for a time extension with supporting documentation, including a schedule impact analysis (sometimes referred to as a time impact analysis) in form acceptable to the Owner and the Engineer indicating the activities affected and overall impact on the schedule of the proposed change.

32.5 Change Proposals shall be furnished promptly so as to occasion no delay in the Work, and shall be furnished at the Contractor's expense. By submitting a Change Proposal, the Contractor shall be deemed to certify in writing that the Change Proposal includes all Work affected by the change, that the cost estimate indicated in the Change Proposal includes all direct, supplemental, indirect, consequential, serial and cumulative costs and delays, as applicable, and that those costs and delays would be necessarily incurred if the change or extra Work is ordered, despite the Contractor's commercially reasonable and diligent efforts to mitigate them. The Contractor shall cooperate fully with the Owner and the Engineer to provide sufficient substantiation and explanation of costs and schedule impacts to allow the Owner and the Engineer to reasonably evaluate the Change Proposal.

32.6 If the Contractor believes that a change has occurred by reason of any Work performed or materials furnished or by reason of any direction or interpretation by the Owner or the Engineer or by reason of any other event, circumstance or occurrence, the Contractor shall submit to the Owner a notice of claim or Contractor Change Notice and shall thereafter request that a Change Order be issued by submitting to the Owner a "Contractor Change Request" within ten (10) days of discovery of the need for the change reflected in the Contractor Change Requests. A Contractor Change Request shall be expressly identified as such and shall contain, at a minimum, the information and certifications required to be included in a Change Proposal. Without limitation, a Contractor Change Request must detail the character and scope of the Work involved and provide clear and detailed justification that a change has occurred or that the Contractor is otherwise entitled to an adjustment in the Contract Sum or the Contract Time, and shall include the applicable Contract Document references supporting the Contractor's claim and the efforts taken and to be taken by the Contractor to prevent or minimize costs or schedule extension. All Contractor Change

Requests submitted by the Contractor shall provide sufficient detail for the Owner to understand the basis for the adjustment in compensation or schedule extension requested. The Contractor shall furnish, within five (5) days after request from the Owner or the Engineer, such further information and details including but not limited to books of account, records and other documents of the Contractor or its Subcontractors or Sub-subcontractors as may be required by the Owner or the Engineer to determine the facts or issues involved in the Contractor Change Request. The Contractor's failure to deliver such information shall be sufficient cause for rejecting any Contractor Change Request. If the Owner fails to notify the Contractor as to the Owner's determination with respect to a Contractor Change Request within thirty (30) days after receipt by the Owner of a full and complete Contractor Change Request as provided herein, such failure shall be deemed to constitute a determination by the Owner that no change has occurred, and such deemed determination shall be effective as of the last day of such thirty-day period. If the Owner rejects (or is deemed to have rejected) a Contractor Change Request in whole or in part and the Contractor disputes such rejection, such dispute shall be resolved as provided in Article 35. Failure of the Contractor to comply strictly with the notice requirements and time periods set forth in Article 34 and this Article 32 shall be conclusively deemed to constitute a waiver by the Contractor of any Claim or any other right to an adjustment in the Contract Sum or the Contract Time with respect to any Work or any other occurrence, event or circumstance which is the subject of a Contractor Change Request, Change Proposal or other Claim of the Contractor.

32.7 This contract shall not be deemed to have been made until the auditor or accountant or other officer of the Owner having similar duties has certified thereon that an appropriation in the amount of this contract is available therefore and that an officer or agent of the Owner has been authorized to execute said contract and approve all requisitions and change orders. No order to the Contractor for a change in or addition to the Work, whether in the form of a drawing, plan, detail or any other written instruction, unless it is an order which the Contractor is willing to perform without any increase in the contract price, shall be deemed to be given until the auditor or accountant, or other officer of the Owner having similar duties, has certified thereon that an appropriation in the amount of such order is available therefore; but such certificate shall not be construed as an admission by the Owner of its liability to pay for such Work.

32.8 The Contractor shall perform all work as directed by the Engineer and Owner, and if the Engineer and Owner determines that certain work for which the Contractor has requested a change order does not represent a change in the Work under the Contract, or if the Contractor, the Engineer, and the Owner cannot agree to the amount of compensation for a change order, the Contractor shall perform said work under protest and must follow the notice requirements and maintain the records required by Claims in the Contract Documents.

33. STATUTORY CHANGE ORDER PROVISIONS

33.1 IN addition to the foregoing, Contract may seek an equitable adjustment pursuant to Massachusetts General Laws Chapter 30, §39N, reproduced below, where applicable.

“Chapter 30: Section 39N. Construction contracts; equitable adjustment in contract price for differing subsurface or latent physical conditions

Section 39N. Every contract subject to section forty-four A of chapter one hundred and forty-nine or subject to section thirty-nine M of chapter thirty shall contain the following paragraph in its entirety and an awarding authority may adopt reasonable rules or regulations in conformity with that paragraph concerning the filing, investigation and settlement of such claims:

If, during the progress of the work, the contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the contract documents either the contractor or the contracting authority may request an equitable adjustment in the contract price of the contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a contractor, or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract price and the contract shall be modified in writing accordingly.”

34. TIMELY DECISION BY OWNER OR ENGINEER

34.1 Whenever this Contract requires the Owner or its Engineer to make a decision during construction of the Project, on interpretation of the specifications, approval of equipment, material or any other approval, or progress of the work, that decision shall be made promptly and, in any event, no later than thirty days after receipt of a written submission for such decision by the Contractor; but if such decision requires extended investigation and study, the Owner or the Engineer shall within thirty days after the receipt of the submission, give the Contractor written notice of the reasons why the decision cannot be made within the thirty day period and the date by which the decision will be made.

34.2 The Contractor shall notify the owner in writing of a “Timely Decision” request that has not received response as required prior to the expiration of twenty-eight days of the written request.

35. CLAIMS AND DISPUTES

35.1 A Claim is a demand by one of the parties seeking adjustment or interpretation of Contract terms or contract documents, payment of money, or extension of time. Claims also include other disputes between the Owner and Contractor or the Contractor and the Engineer arising out of the Contract. Claims must be initiated by written notice to the Owner. The responsibility to substantiate a claim shall rest with the Contractor.

35.2 The Contractor shall notify the Owner within seven (7) days after occurrence of the event giving rise to any claim. The Contractor shall fully document and detail the factual and contractual basis of the Claim in writing to the Owner within thirty (30) days of the initial seven (7) day

notification of claim. The Contractor shall have the burden of demonstrating the effect of the claim and shall furnish the Owner with such documentation and information as the Owner may reasonably require.

35.3 When a claim is resolved by a Change Order signed by the Owner and the Contractor, the Change Order shall represent the entire compensation, including without limitation all direct, indirect, consequential, and other costs, mark-ups, and damages and all extensions of time, owed to the Contractor for the events or circumstances giving rise to the claim.

35.4 Pending resolution of a claim or dispute, the Contractor must proceed with the disputed Work, as directed by the Engineer or the Owner. The Contractor must give written notice to the Owner and the Engineer stating that the Contractor is proceeding with the disputed work under protest. Accurate records of the nature and extent of the disputed Work and of the time spent, labor, materials, and equipment used on the disputed Work shall be maintained by the superintendent and verified daily by the Owner or Engineer. Failure of the Contractor to maintain such records shall cause the Contractor to forfeit its claim to additional compensation for such disputed work.

35.5 Pending final resolution of Claims, unless agreed in writing by the Owner, the Contractor shall proceed diligently with the performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

35.6 The Owner will not be obligated under Claims to grant an extension of time unless the contractor can demonstrate that the critical path has been negatively affected.

35.7 The Owner shall resolve all Claims in the manner it deems appropriate and shall provide the Contractor with a written description of such resolution within thirty (30) days of receipt of the Claim. If the Owner cannot resolve the Claim within thirty (30) days, the Owner shall send a written notice to the Contractor. If the Owner fails to resolve a Claim within the thirty (30) days of receipt, or any extended period, or by final payment, the Claim shall be deemed to be denied by the Owner.

35.8 The Contractor, as a precondition to commencing litigation shall have fully complied with the requirements that its claim has been denied or deemed denied and that the Contractor has complied with all other applicable provisions of the Contract Documents, including those provisions that are applicable to the Work that is the subject of the Claim.

35.9 Notwithstanding any contrary provision of this contract, no decision by the Owner or by the Engineer on a dispute, whether of fact or of law, arising under said contract shall be final or conclusive if such decision is made in bad faith, fraudulently, capriciously, or arbitrarily, is unsupported by substantial evidence, or is based upon error of law.

36. SCHEDULE OF VALUES

36.1 Before the first Application for Payment, the Contractor shall submit to the Engineer a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Engineer or Owner may require. The Schedule of Values shall be approved by the Owner. This schedule, unless objected to by the Engineer or

Owner, shall be used as a basis for reviewing the Contractor's Applications for Payment. The Contractor shall not imbalance its Schedule of Values nor artificially inflate any element thereof. The violation of this provision by the Contractor shall constitute a material breach of this Contract.

36.2 The schedule of values shall contain a separate item for each Section of the Specifications broken down in such form as the Engineer may require.

37. APPLICATIONS FOR PAYMENT

37.1 Retainage – The Contractor agrees that the Owner may retain from all of the payments due, including final payment, under this contract, five percent (5%) of the amount thereof, and may expend the same, in the manner hereinafter provided, in making such repairs or replacements of said work as the Owner may deem expedient.

37.2 At least (30) days prior to the date established for progress payments, the Contractor shall submit to the Engineer an itemized Application for Payment for the Work completed consistent with the Contract Documents and the Schedule of Values including lien waivers from the Contractor and all subcontractors and suppliers and all other supporting documentation that the Owner may reasonably require. The Engineer's certification of said application shall signify that the Work has progressed to the point indicated and that, to the best of the Engineer's knowledge and information, the quality of the Work is in accordance with the Contract Documents. The Engineer's certification is subject to an evaluation of the Work for conformance with the Contract Documents prior to Substantial Completion, and subsequent results of tests and inspections, to correction of minor deviations from the Contract Documents and to specific qualifications expressed by the Engineer. The certification of the Application for Payment shall not eliminate the Contractor's requirements for the Work to comply with the Contract Documents at any time.

37.3 Such Application for Payment shall be notarized by the Contractor. Applications for payment shall not include requests for payments that the Contractor does not intend to pay to a Subcontractor or material supplier based on a dispute or any other reason. The Contractor shall certify that all previous certificates for payment have been previously issued and payments received from Owner, to the best of the Contractor's knowledge, are free of liens, claims, security interests, or encumbrances in the favor of the Contractor, subcontractors, material suppliers, or other persons or entities making a claim by having provided labor, materials, equipment relating to the Work. The Owner may request certification from subcontractors or a waiver of liens to this effect.

38. CERTIFICATES FOR PAYMENT

38.1 The Engineer shall mark the date of receipt on the Contractor's Application for Payment. The Engineer shall, within seven days after receipt of the Contractor's Application for Payment:

1. issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Engineer determines are properly due according to the terms of the Contract Documents;
2. return the application to the Contractor if it is not in proper form or containing computations not arithmetically correct;

3. make changes to the application; or
4. reject in whole or in part the application and notify the Contractor and Owner in writing of the Engineer's reasons for withholding certification in whole or in part. Such reasons may include, without limitation:
 - i. The quality of a portion, or all, of the Contractor's work not being in accordance with the Contract Documents;
 - ii. The quantity of the Contractor's work not being as represented in the Application for Payment;
 - iii. The Contractor's rate of progress being such that, in the opinion of the Owner, Substantial or Final Completion, or both may be delayed or that the Work cannot be completed for the unpaid balance of the Contract Sum;
 - iv. The Contractor's failure to use Contract funds, previously paid the Contractor by the Owner, to pay Contractor's Project-related obligations, including, but not limited to, subcontractors, laborers and material and equipment suppliers;
 - v. Claims made, or likely to be made, against the Owner or its property;
 - vi. Loss or damage cause by the Contractor;
 - vii. Any lien or attachment not discharged as required under Section 38.4; or
 - viii. Contractor's failure or refusal to perform any of its obligations under the Contract Documents.

38.2 The Owner may make changes in any Application for Payment submitted by the Contractor and the payment due on said Application for Payment shall be computed in accordance with those changes. The Owner may require the Contractor to resubmit the Application for Payment with the Engineer and the Owners corrections reflected. Such resubmitted Application for Payment shall be clearly marked a resubmittal and dated.

38.3 No certificate for payment nor any progress payment shall constitute acceptance of Work not in accordance with the Contract Documents.

38.4 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner upon the first to occur of (a) incorporation into the Work and (b) no later than the time of payment on such Application. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall , to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in

favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work. If a lien is filed or claimed against the Work by any Subcontractor, laborer, or supplier, the Contractor shall immediately, at its expense, bond such lien in accordance with Massachusetts General Laws, or otherwise cause such lien to be discharged in a manner acceptable to the Owner and its lender; provided, however, that the Contractor shall not be obligated to bond or discharge any such lien to the extent such lien is the result of the Owner's failure to make payment for the Work in accordance with the Contract. If the Contractor shall fail to do so, the Owner may, at its option and at the Contractor's expense, bond such lien or otherwise cause it to be discharged, and deduct all amounts so paid from the Contract Sum or from the next succeeding Application(s) for Payment until the total amount of same is recouped by the Owner.

38.5 No portion of the Contract Sum will be obligated for payment of costs incurred with respect to any action of the project after the Owner has requested that the Contractor furnish data concerning such action prior to proceeding further, unless and until the Contractor is thereafter advised in writing by the Owner that there is no objection to so proceeding.

38.6 The Contractor agrees to refund to the Owner, payment which the Owner determines were not properly due to the Contractor under the terms of the Contract Documents.

39. PAYMENT FOR STORED MATERIALS

39.1 The Contractor shall include in such Application for Payment only such materials as are incorporated in the Work. Except however, the Contractor may, with prior written authorization of the Owner, include the value of materials or equipment delivered at the site of the Work, or at some location agreed to in writing by the Owner and Engineer and that shall be suitably stored and within 25 miles of the Project and accessible for inspection and testing as determined to be necessary by the Engineer and Owner, upon delivery to the Owner of:

1. a Transfer of Title in a form acceptable to the Owner; and
2. a receipt of payment by the Contractor for stored materials and equipment charges for storage, insurance or encumbrances, and transportation costs to the Project, and
3. a receipted invoices or other acceptable proof of prior payment by the Contractor for such materials or equipment; and
4. a stored materials insurance binder that covers the materials for which payment is requested, that names the Owner as an insured party should the stored materials be subjected to any vandalism, casualty, loss, or theft prior to their inclusion in the Work.
5. Written confirmation by the Engineer to the Owner that this material(s) or equipment, in the judgment of the Engineer meets the requirements of the Contract Documents, is ready for prompt use; and is properly stored by the Contractor and adequately protected until incorporated into the Work.

40. PROGRESS PAYMENTS

40.1 After the Engineer has issued a Certificate for Payment, the Owner shall make payments to the Contractor in accordance with M.G.L.c.30 39K provided below.

40.1.1 “Chapter 30: Section 39K. Public building construction contracts; payments

Section 39K. Every contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building by the commonwealth, or by any county, city, town, district, board, commission or other public body, when the amount is more than five thousand dollars in the case of the commonwealth and more than two thousand dollars in the case of any county, city, town, district, board, commission or other public body, shall contain the following paragraph:— Within fifteen days (30 days in the case of the commonwealth, including local housing authorities) after receipt from the contractor, at the place designated by the awarding authority if such a place is so designated, of a periodic estimate requesting payment of the amount due for the preceding month, the awarding authority will make a periodic payment to the contractor for the work performed during the preceding month and for the materials not incorporated in the work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the contractor has title or to which a subcontractor has title and has authorized the contractor to transfer title to the awarding authority, upon certification by the contractor that he is the lawful owner and that the materials are free from all encumbrances, but less (1) a retention based on its estimate of the fair value of its claims against the contractor and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and less (3) a retention not exceeding five per cent of the approved amount of the periodic payment. After the receipt of a periodic estimate requesting final payment and within sixty-five days after (a) the contractor fully completes the work or substantially completes the work so that the value of the work remaining to be done is, in the estimate of the awarding authority, less than one per cent of the original contract price, or (b) the contractor substantially completes the work and the awarding authority takes possession for occupancy, whichever occurs first, the awarding authority shall pay the contractor the entire balance due on the contract less (1) a retention based on its estimate of the fair value of its claims against the contractor and of the cost of completing the incomplete and unsatisfactory items of work and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, or based on the record of payments by the contractor to the subcontractors under this contract if such record of payment indicates that the contractor has not paid subcontractors as provided in section thirty-nine F. If the awarding authority fails to make payment as herein provided, there shall be added to each such payment daily interest at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston commencing on the first day after said payment is due and continuing until the payment is delivered or mailed to the contractor; provided, that no interest shall be due, in any event, on the amount due on a periodic estimate for final payment until fifteen days (twenty-four days in the case of the commonwealth) after receipt of such a periodic estimate from the contractor, at the place designated by the awarding authority if such a place is so designated. The contractor agrees to pay to each subcontractor a portion of any such interest paid in accordance with the amount due each subcontractor.

The awarding authority may make changes in any periodic estimate submitted by the contractor and the payment due on said periodic estimate shall be computed in accordance with the changes so made, but such changes or any requirement for a corrected periodic estimate shall not affect the due date for the periodic payment or the date for the commencement of interest charges on the amount of the periodic payment computed in accordance with the changes made, as provided herein; provided, that the awarding authority may, within seven days after receipt, return to the contractor for correction, any periodic estimate which is not in the required form or which contains computations not arithmetically correct and, in that event, the date of receipt of such periodic estimate shall be the date of receipt of the corrected periodic estimate in proper form and with arithmetically correct computations. The date of receipt of a periodic estimate received on a Saturday shall be the first working day thereafter. The provisions of section thirty-nine G shall not apply to any contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building to which this section applies.

All periodic estimates shall be submitted to the awarding authority, or to its designee as set forth in writing to the contractor, and the date of receipt by the awarding authority or its designee shall be marked on the estimate. All periodic estimates shall contain a separate item for each filed subtrade and each sub-subtrade listed in sub-bid form as required by specifications and a column listing the amount paid to each subcontractor and sub-subcontractor as of the date the periodic estimate is filed. The person making payment for the awarding authority shall add the daily interest provided for herein to each payment for each day beyond the due date based on the date of receipt marked on the estimate.

A certificate of the Engineer to the effect that the contractor has fully or substantially completed the work shall, subject to the provisions of section thirty-nine J, be conclusive for the purposes of this section.

Notwithstanding the provisions of this section, at any time after the value of the work remaining to be done is, in the estimation of the awarding authority, less than 1 per cent of the adjusted contract price, or the awarding authority has determined that the contractor has substantially completed the work and the awarding authority has taken possession for occupancy, the awarding authority may send to the general contractor by certified mail, return receipt requested, a complete and final list of all incomplete and unsatisfactory work items, including, for each item on the list, a good faith estimate of the fair and reasonable cost of completing such item. The general contractor shall then complete all such work items within 30 days of receipt of such list or before the contract completion date, whichever is later. If the general contractor fails to complete all incomplete and unsatisfactory work items within 45 days after receipt of such items furnished by the awarding authority or before the contract completion date, whichever is later, subsequent to an additional 14 days' written notice to the general contractor by certified mail, return receipt requested, the awarding authority may terminate the contract and complete the incomplete and unsatisfactory work items and charge the cost of same to the general contractor and such termination shall be without prejudice to any other rights or remedies the awarding authority may have under the contract. The awarding authority shall note any such termination in the evaluation form to be filed by the awarding authority pursuant to the provisions of section 44D of chapter 149."

41. SUB-CONTRACTOR PROGRESS PAYMENTS

41.1 The Contractor shall make payments to Subcontractors in accordance with M.G.L.c.30 39F provided below.

41.1.1 “Chapter 30: Section 39F. Construction contracts; assignment and subrogation; subcontractor defined; enforcement of claim for direct payment; deposit, reduction of disputed amounts

Section 39F. (1) Every contract awarded pursuant to sections forty-four A to L, inclusive, of chapter one hundred and forty-nine shall contain the following subparagraphs (a) through (i) and every contract awarded pursuant to section thirty-nine M of chapter thirty shall contain the following subparagraphs (a) through (h) and in each case those subparagraphs shall be binding between the general contractor and each subcontractor.

(a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(b) Not later than the sixty-fifth day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(c) Each payment made by the awarding authority to the general contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a subcontractor shall be made to the general contractor for the account of that subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor or which is to be included in a payment to the general contractor for payment to the subcontractor as provided in subparagraphs (a) and (b), the awarding authority shall act upon the demand as provided in this section.

(d) If, within seventy days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the subcontractor may demand direct payment of that balance from the awarding authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by

certified mail to the general contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after the subcontractor has substantially completed the subcontract work. Within ten days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.

(e) Within fifteen days after receipt of the demand by the awarding authority, but in no event prior to the seventieth day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the general contractor in the sworn reply; provided, that the awarding authority shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The awarding authority shall make further direct payments to the subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.

(f) The awarding authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor and shall notify the general contractor and the subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the general contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.

(h) The awarding authority shall deduct from payments to a general contractor amounts which, together with the deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from subcontractors. All such amounts shall be earmarked for such direct payments, and the subcontractors shall have a

right in such deductions prior to any claims against such amounts by creditors of the general contractor.

(i) If the subcontractor does not receive payment as provided in subparagraph (a) or if the general contractor does not submit a periodic estimate for the value of the labor or materials performed or furnished by the subcontractor and the subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (a), the subcontractor may demand direct payment by following the procedure in subparagraph (d) and the general contractor may file a sworn reply as provided in that same subparagraph. A demand made after the first day of the month following that for which the subcontractor performed or furnished the labor and materials for which the subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the general contractor. Thereafter the awarding authority shall proceed as provided in subparagraph (e), (f), (g) and (h).

(2) Any assignment by a subcontractor of the rights under this section to a surety company furnishing a bond under the provisions of section twenty-nine of chapter one hundred forty-nine shall be invalid. The assignment and subrogation rights of the surety to amounts included in a demand for direct payment which are in the possession of the awarding authority or which are on deposit pursuant to subparagraph (f) of paragraph (1) shall be subordinate to the rights of all subcontractors who are entitled to be paid under this section and who have not been paid in full.

(3) "Subcontractor" as used in this section (i) for contracts awarded as provided in sections forty-four A to forty-four H, inclusive, of chapter one hundred forty-nine shall mean a person who files a sub-bid and receives a subcontract as a result of that filed sub-bid or who is approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, (ii) for contracts awarded as provided in paragraph (a) of section thirty-nine M of chapter thirty shall mean a person approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, and (iii) for contracts with the commonwealth not awarded as provided in forty-four A to forty-four H, inclusive, of chapter one hundred forty-nine shall also mean a person contracting with the general contractor to supply materials used or employed in a public works project for a price in excess of five thousand dollars.

(4) A general contractor or a subcontractor shall enforce a claim to any portion of the amount of a demand for direct payment deposited as provided in subparagraph (f) of paragraph 1 by a petition in equity in the superior court against the other and the bank shall not be a necessary party. A subcontractor shall enforce a claim for direct payment or a right to require a deposit as provided in subparagraph (f) of paragraph 1 by a petition in equity in the superior court against the awarding authority and the general contractor shall not be a necessary party. Upon motion of any party the court shall advance for speedy trial any petition filed as provided in this paragraph. Sections fifty-nine and fifty-nine B of chapter two hundred thirty-one shall apply to such petitions. The court shall enter an interlocutory decree upon which execution shall issue for any part of a claim found due pursuant to sections fifty-nine and fifty-nine B and, upon motion of any party, shall advance for speedy trial the petition to collect the remainder of the claim. Any party aggrieved by such interlocutory decree shall have the right to appeal therefrom as from a final decree. The court shall not consolidate for trial the petition of any subcontractor with the petition

of one or more subcontractors or the same general contract unless the court finds that a substantial portion of the evidence of the same events during the course of construction (other than the fact that the claims sought to be consolidated arise under the same general contract) is applicable to the petitions sought to be consolidated and that such consolidation will prevent unnecessary duplication of evidence. A decree in any such proceeding shall not include interest on the disputed amount deposited in excess of the interest earned for the period of any such deposit. No person except a subcontractor filing a demand for direct payment for which no funds due the general contractor are available for direct payment shall have a right to file a petition in court of equity against the awarding authority claiming a demand for direct payment is premature and such subcontractor must file the petition before the awarding authority has made a direct payment to the subcontractor and has made a deposit of the disputed portion as provided in part (iii) of subparagraph (e) and in subparagraph (f) of paragraph (1).

(5) In any petition to collect any claim for which a subcontractor has filed a demand for direct payment the court shall, upon motion of the general contractor, reduce by the amount of any deposit of a disputed amount by the awarding authority as provided in part (iii) of subparagraph (e) and in subparagraph (f) of paragraph (1) any amount held under a trustee writ or pursuant to a restraining order or injunction.”

42. WARRANTY

42.1 The Contractor warrants to the Owner and Engineer that all of the materials and equipment furnished under the Contract will be of good quality and new unless otherwise required by the Contract Documents, that all of the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. Unless otherwise provided, all special guarantees and warranties referred to in the Contract Documents shall commence as of the date of Substantial Completion of the Work, except that warranties on any items or systems completed after Substantial Completion shall commence when such items or systems have been completed. All such guarantees and warranties shall extend for the period of time provided therein. Copies of all such warranties shall be submitted to the Owner prior to final payment. The failure to deliver a required guarantee or warranty shall constitute a failure to fully complete the Work in accordance with the Contract Documents. Delivery by the Contractor shall constitute the Contractor's guarantee to the Owner that the warranties will be performed in accordance with their terms and conditions. All Subcontractors' and manufacturers' warranties required under the Contract Documents shall be deemed to be assigned to the Owner pursuant to this Contract whether or not such warranties are physically delivered to the Owner as required.

42.2 The warranties in this Section shall be in addition to and not in limitation of any other warranty required by the Contract Documents or otherwise prescribed by law.

42.3 The Contractor shall be responsible for determining that all materials furnished for the Work meet the requirements of the Contract Documents. The Engineer may require the Contractor to produce reasonable evidence that a material meets such requirements, such as certified reports of tests by qualified testing laboratories, reports of studies by qualified experts, or other evidence which the Engineer requests that would lead to a reasonable certainty that the material used, or proposed to be used, for the Work meets the Contract Documents requirements. All such data shall be furnished at the Contractor's expense.

42.4 Any additional cost, or any loss or damage arising from the substitution of any material or any method for Work originally specified shall be paid by the Contractor, unless such substitution was made at the written request or direction of the Owner or Engineer.

42.5 No additional charge shall be made by the Contractor for attending meetings at the site to diagnose problems or to instruct the Owner's personnel in the proper operation or maintenance of the Work, or for making initial or seasonal adjustments (not including normal maintenance) of mechanical systems or other Work during the applicable warranty period. The Contractor shall provide such service promptly upon request from the Owner. In case of emergency, service shall be provided as necessary to avoid loss or damage or to maintain normal use of the premises.

43. GENERAL GUARANTY

43.1 If at any time during the period of one (1) year from the date of Substantial Completion part of the Work, or any material or equipment that is part of the Work, shall, in the reasonable determination of the Engineer or Owner, require replacing or repairing due to the fact that it is broken, defective, or otherwise does not conform to the Contract Documents, the Owner will notify the Contractor to make the required repairs or replacement.

43.2 If the Contractor shall neglect to commence such repairs or replacement to the satisfaction of the Owner within ten (10) days from the date of in hand personal delivery or mailing such notice, then the Owner may employ other persons to make the same.

43.3 The Contractor agrees, upon demand, to pay to the Owner all amounts, which the Owner expends for such repairs or replacements.

43.4 During this one-year guarantee period any corrective work shall be performed in accordance with the applicable terms of this Contract. For items of work completed after use and occupancy has been taken, the one year guarantee shall commence at the time the Owner accepts such items.

43.5 The one year guarantee shall not limit any express guaranty or warranty provided elsewhere in the Contract Documents, nor does it limit the time which proceedings may be commenced to establish Contractor's liability with respect to the Contractor's obligations of the Contract Documents, nor does it limit the time of the obligations of the Contract Documents of unforeseen conditions or failure to carry out work according to the Contract Documents.

43.6 The Contractor's obligation to correct Work is in addition to, and not in substitution of, such guarantees or warranties as may be required in the various Sections of the Specifications.

44. ENERGY STAR

44.1 The Contractor shall be responsible for achieving and providing Energy Star Certification prior to Substantial Completion approval.

44.2 The Contractor shall prepare, submit, and pay processing fee for all applications for rebates for Energy Star Components, Energy Star Certifications, or non-Energy Star components that are available as part of the Work or any components of the Work for the project.

44.3 The Contractor shall verify that all Rebate refunds are made payable and delivered to the Owner with the appropriate project reference annotated thereof.

45. SUBSTANTIAL COMPLETION

45.1 Substantial completion is the stage in the progress of the Work when the Work or a designated portion of the work is sufficiently complete and in accordance with the Contract Documents so that the Owner can occupy or use the Work for its intended purpose with only minor items which have no material effect on the use, function or value of the Work and which can be corrected or completed without any interference with the Owner's use of the Work remaining to be corrected or completed.

45.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Engineer a comprehensive list of items to be completed or corrected. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents.

45.3 Upon receipt of the Contractor's list of items to be completed or corrected, the Engineer shall promptly make a thorough inspection and prepare a "punch list", setting forth in accurate detail any items on the Contractor's list and additional items that are not acceptable or are incomplete.

45.4 If, after receipt of the Contractor's list, the Engineer determines that the Work is not substantially complete, the Engineer shall inform the Contractor of those items that must be completed before the Engineer will prepare a punch list. Upon completion of those items, the Contractor shall again request the Engineer to prepare the punch list.

45.5 When the punch list has been prepared, the Contractor shall arrange a meeting with the Engineer and Subcontractors to identify and explain all punch list items and address questions on the work which must be done before final acceptance.

45.6 The Engineer may revise the punch list, from time to time, to ensure that all items of the Work are properly completed.

45.7 The Contractor shall complete all the remaining items of the Work, as soon as possible, and in any event within one hundred and twenty days after Substantial Completion, unless the

Engineer determines that a shorter time period for completion is appropriate, in which event the Contractor must complete the Contract work within such period.

45.8 If the Contractor fails to complete the remaining items of Work within the time period provided the Owner may arrange for other contractors to complete such items and the direct and indirect costs of such completion shall be charged against the balance due the Contractor or, if no such balance remains, the Contractor shall pay the Owner the costs of such completion. Alternatively, the Owner may invoke the performance bond of the Contractor and demand that the surety shall complete the remaining items of work in a timely manner.

45.9 The Engineer will conduct up to three (3) inspections of completed punch list items. The Contractor shall be responsible for the costs of additional inspections required to verify successful completion of the punch list.

45.10 Upon verification of submittals and inspection by the Owner and Engineer that the Work or a portion of the Work the contractor has requested has reached Substantial Completion, the Owner shall authorize the Engineer to prepare a Certificate of Substantial Completion establishing the Date and stating the responsibilities of the Owner and the Contractor for utilities, heat, damage, insurance, maintenance, and security. The Contractor and the Owner shall provide written acceptance of the terms of the Certificate.

46. PARTIAL OCCUPANCY

46.1 The Owner may partially occupy or use a portion of the Work that has not reached Substantial Completion. In such an event, the Owner and the Contractor shall prepare a written agreement agreeing on the terms of payments for security, maintenance, heat utilities, damage to the Work, insurance, correction of the Work, and warranties. The Engineer shall inspect and document the area, with the Owner and the Contractor that shall be Partially Occupied prior to the Owner's partial occupancy. Partial Occupancy by the Owner shall not constitute acceptance of any Work not complying with the Contract Documents.

46.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Engineer shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

46.3 Upon receipt of notice of intent to partially occupy, the Contractor shall promptly secure and submit to the Engineer endorsement from all insurance carriers issuing policies covering the Work permitting use and occupancy of the Work, or any designated portion thereof, by the Owner prior to Substantial Completion of the entire Project.

47. FINAL PAYMENT

47.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Engineer will promptly make such inspection and, when the Engineer finds the Work acceptable under the Contract Documents and the Contract fully performed, the Engineer will promptly issue a final Certificate for Payment stating that to the best of the Engineer's knowledge, information and belief, and on the basis of the Engineer's on-site visits and inspections, the Work has been completed in

accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Engineer's final Certificate for Payment will constitute a further representation that conditions listed in Section 47.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

47.2 Prior to and as a condition precedent to final payment, all of the following matters shall have been resolved and documents and items shall have been received and approved in writing by the Owner: (1) final documents of similar nature to those required by the Contract Documents in connection with any Application for Payment hereunder; (2) proof of the satisfactory completion of all required inspections and issuance of all final permits, approvals, sign-offs, certificates, affidavits, and authorizations for use and occupancy of the Project required by any authority having jurisdiction, including an unconditional and full permanent certificate of occupancy, (3) formally prepared "as built" Record Drawings, Specifications, records and related data, all in accordance with the requirements of the Contract Documents, (4) all operating and maintenance manuals and parts lists required by the Contract Documents, (5) all guarantees and warranties to which the Owner is entitled hereunder, (6) satisfactory proof that all claims arising out of the Work and any liens arising out of the same that have been filed or recorded have been released or bonded, (7) acknowledgement of prior payments and final waivers of lien from the Contractor and all Subcontractors and suppliers, (8) the Engineer's certificate certifying that the Work is complete and complies with the Contract Documents, (9) if applicable, a satisfactory report by the Contractor that is approved by the Engineer that all mechanical systems have been approved and are properly balanced, (10) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible have been paid or otherwise satisfied, (11) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (12) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (13) consent of surety, if required, to final payment, and (14) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor shall furnish a bond satisfactory to the Owner to indemnify the Owner against any claim, including any lien that a Subcontractor may assert against the Owner.

47.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Engineer so confirms, the Owner shall, upon application by the Contractor and certification by the Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Engineer prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

47.4 The making of final payment shall constitute a waiver of claims by the Owner except those arising from:

1. liens, claims, security interests or encumbrances arising out of the Contract and unsettled;
2. failure of the Work to comply with the requirements of the Contract Documents;
3. terms of warranties required by the Contract Documents; or
4. faulty or defective work appearing after Final Payment.

47.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

47.6 The Owner may withhold from payment on the final Application for Payment any amount to which it would have been entitled to withhold payment on any other Application for Payment pursuant to Section 38.

48. RECORD KEEPING

48.1 The Contractor shall make, and keep for at least six years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the Contractor.

48.2 Until the expiration of six years after final payment, the Inspector General, the Owner, and the Department shall have the right to examine any books, documents, papers or records of the Contractor and Subcontractors that directly pertain to, and involve transactions relating to the Contractor and Subcontractors.

48.3 The Contractor shall describe any change in the method of maintaining records or recording transactions which materially affects any statements filed with the Owner including the date of the change and reasons therefor, and shall accompany said description with a letter from the Contractor's independent certified public accountant approving or otherwise commenting on the changes.

49. TERMINATION

49.1 The Owner shall, in addition to any other rights or remedies it may have under this Contract or pursuant to any applicable law, have the right to terminate the employment of the Contractor if the Contractor:

1. repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
2. fails to make payment to subcontractors for materials or labor in accordance with the respective agreements between the Contractor and subcontractors;

3. repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of the Owner or any other public authority;
4. is guilty of substantial breach of a provision of the Contract Documents;
5. sublets or assigns all or any portion of the Work, the Contract, or claims thereunder, without the prior written consent of the Owner, except as provided in the Contract;
6. the Engineer and/or the Owner has determined that the rate of progress required on the project is not being met, and that Substantial Completion of the Work shall not occur consistent with the Contract Documents; or
7. the Contractor has violated the Contract Documents by providing sub-standard workmanship in the opinion of the Engineer and/or the Owner.

49.2 If the right of the Contractor to proceed is so terminated, the Owner may, without prejudice to any other rights or remedies of the Owner, and after giving the Contractor and the Contractor's surety, five (5) business days' written notice, terminate the Contract and the employment of the Contractor and may, subject to any prior rights of the surety, take any one or more of the following actions:

1. take possession of and utilize in completing the Work such materials, appliances, supplies, plant and equipment as may be on the site of the Work, and necessary therefore. The Owner shall not be liable for any depreciation, loss or damage to said materials, machinery, implements or tools during said use and the Contractor shall be solely responsible for their removal from the Project site after the Owner has no further use for them;
2. exclude the Contractor from the site of the Work;
3. accept assignment of subcontracts in accordance with Section 9.3 of this Contract;
4. finish the Work by whatever reasonable method the Owner may deem expedient through the Owner's forces or the hiring of other contractors; or
5. require the surety or sureties to complete the Contract.

49.3 Upon termination of the Contract by the Owner, no further payments shall be due the Contractor until the Work is completed. If the unpaid balance of the Contract Sum shall exceed the cost of completing the Work, including all overhead costs, the excess shall be paid to the Contractor. If the cost of completing the Work shall exceed the unpaid balance, the Contractor or the Contractor's sureties shall pay the difference to the Owner. The cost incurred by the Owner, as herein provided, and the damage incurred through the Contractor's default, shall be certified by the Owner at the Contractor's request. This obligation for payment shall survive termination of the Contract.

49.4 All expenses charged under termination shall be deducted and paid by the Owner out of any monies then due or to become due the Contractor under this Contract; and in such accounting

the Owner shall not be held to obtain the lowest figures, by competitive bid or otherwise, for the completion of the Work or any part thereof.

49.5 Expenses incurred in termination shall also include, but not be limited to, costs for engineering extra services, additional Clerk of the Work services, and Owner's representative services required, in the opinion of the Owner, to successfully inspect and administer the construction contract through final completion.

49.6 In addition to the termination rights provided in Sections 49.1-75.5 above, the Owner may, at any time, terminate the Contract for the Owner's convenience and without cause. Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

1. cease operations as directed by the Owner in the notice;
2. take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
3. except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment in an amount equal to direct, out-of-pocket costs incurred by the Contractor (including costs incurred in the cancellation of subcontracts). The Contractor shall include in all subcontracts provisions allowing for the termination of such subcontracts for convenience without penalty or unearned profit.

50. PROTECTION OF LIVES AND HEALTH

50.1 The Contractor shall comply with all applicable laws both the Commonwealth of Massachusetts and Federal laws, ordinances, rules, regulations, and lawful orders of public authorities regarding safety of persons or property or protection from damage, injury or loss, and provide all safety training, and verification of license requirements for all Subcontractors and employees of the Contractor. The Contractor shall bear the cost of all loss and shall reimburse the Owner for all costs incurred regarding any loss.

50.2 In order to protect the lives and health of employees under the Contract, the Contractor and Subcontractors shall comply with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc. and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the Contract. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of the work and for any damage which may result from their failure or their improper construction, maintenance, or operation.

50.3 The Contractor shall designate the Superintendent, or a member of the Contractor's organization to prevent accidents, and provide written notice to the Owner of the person so designated as the Safety Officer.

50.4 The Contractor shall provide and submit to the Owner, Certification under pains and penalties of perjury that the Contractor is able to furnish labor in harmony with all other elements of labor employed in the Work and that all employees employed on the work site have successfully completed at least ten (10) hours of United States Occupational Safety and Health Administration (OSHA) approved training.

50.5 The Owner shall have the authority to clean up or correct any situation which presents a hazard or unsafe condition or affects the Owner's use of the facility, without any notice requirements to the Contractor. The cost of the Owner's correction of any unsafe condition caused by an act or omission of the Contractor or Subcontractor shall be deducted from the Contract Sum and withheld from any payments otherwise due to the Contractor, at the sole election of the Owner.

51. QUALIFICATIONS FOR EMPLOYMENT

51.1 No persons under the age of sixteen years shall be employed on the project under this Contract. No persons whose age or physical condition is such as to make that persons employment dangerous to their health or safety or to the health or safety of others shall be employed on the project under this Contract; provided, that this shall not operate against the employment of physically handicapped persons, otherwise employable, where such persons may be safely assigned to work which they can ably perform. No person currently serving sentence in a Penal or Correctional Institution and no inmate of an Institution for mental defectives shall be employed in the project under this Contract.

52. MEMBERS OF LOCAL GOVERNING BODY, OR OTHER PUBLIC OFFICIALS

52.1 The Contractor shall incorporate or cause to be incorporated, in all of its agreements, contracts or subcontracts a provision prohibiting such interest pursuant to the purposes of this section.

52.2 No member, officer or employee of the Owner, or its designees or agents, no member of the governing body of the locality in which the project is situated, and no other public officials, member, officer or employee of the Town of Winchester, or its designees or agents, no members of the governing body of such locality or localities who exercises any functions or responsibilities with respect to the project during their tenure or for one year thereafter, shall have any interest, direct or indirect, in any agreement, contract or subcontract, or the proceeds thereof, for work to be performed in connection with the project assisted under this Contract.

53. COMPLIANCE WITH LOCAL, STATE AND FEDERAL LAWS

53.1 The Contract shall be governed by the law of the Commonwealth of Massachusetts without respect to its choice of law rules.

53.2 The Contractor's Work hereunder shall be subject to all applicable Federal, State, and local laws, codes, and regulations, and order of court or administrative agencies. The Contractor shall

comply, and shall require any subcontractor to comply, with the below cited Local, State, and Federal Laws, and shall incorporate these laws in any written agreement between the Contractor and a subcontractor. Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein, whether expressly stated or not.

53.3 If the Contractor is a foreign corporation, it shall comply with M.G.L. c. 156D, and M.G.L. c.30, §39L.

53.4 During the performance of his contract, the Contractor and all of (his) Subcontractors (hereinafter collectively referred to as the Contractor), for himself, his assignees, and successors in interest, agree as follows:

1. In connection with the performance of Work under this contract, the Contractor shall not discriminate against any employee or applicant for employment because of race, color, religious creed, national origin, age, sex, sexual orientation, genetic information, ancestry, handicap, or any other basis prohibited by law. The aforesaid provision shall include, but not be limited to, the following: employment upgrading, demotion, or transfer; recruitment advertising; recruitment layoff; termination; rates of pay or other forms of compensation; conditions or privileges of employment; and selection for apprenticeship.
2. The Contractor, in the performance of all Work after award will not discriminate on grounds of race, color, religious creed, national origin, age, sex, sexual orientation, genetic information, ancestry or handicap, or any other basis prohibited by law, in employment practices, in the selection or retention of Subcontractors, or in the procurement of materials and rentals of equipment.

54. CONTRACTOR'S ACCOUNTING METHODS REQUIREMENTS

54.1 The words defined herein shall have the meaning stated below whenever they appear in this Article 54:

1. "Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a Contract as defined in Subsection 54.1.2.
2. "Contract" means any contract awarded or executed pursuant to M.G.L. c.7, §38A1/2 - 380, inclusive, and any contract awarded or executed pursuant to M.G.L. c. 25A, §11C, M.G.L. c. 30, §39M, or M.G.L. c.149, §44A-44H, inclusive, which is for an amount or estimated amount that exceeds the dollar amount set forth in M.G.L. c.30, §39R.
3. "Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

4. “Independent Certified Public Accountant” means a person duly registered in good standing and entitled to practice as a certified public account under the laws of the place of his residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant’s independence shall not be confined to the relationships existing in connection with the filing of reports with the Owner.
5. “Audit,” when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a CERTIFIED opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.
6. “Accountant’s Report,” when used in regard to financial statements, means a document in which an independent certified public accountant indicates the scope of the audit which he has made and sets forth his opinion regarding the financial statements taken as a whole with a listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefore shall be stated. An accountant’s report shall include as a part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the Contractor.
7. “Management,” when used herein, means the chief executive officers, partners, principals, or other person or persons primarily responsible for the financial and operational policies and practices of the Contractor.
8. Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

54.2 The Contractor shall make, and keep for at least six years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the Contractor.

54.3 Until the expiration of six years after final payment, the Owner, office of Inspector General, and the Deputy Commissioner of the Division of Capital Asset Management and Maintenance shall have the right to examine any books, documents, papers or records of the Contractor or of his Subcontractors that directly pertain to, and involve transactions relating to, the Contractor or his/her Subcontractors.

54.4 If the agreement is a contract as defined herein, the Contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the Owner, including in his description the date of the change and reasons

therefore, and shall accompany said description with a letter from the Contractor's independent certified public accountant approving or otherwise commenting on the changes.

54.5 If the agreement is a contract as defined herein, the Contractor has filed a statement of management on internal accounting controls as set forth in Section 54.7 below prior to the execution of the contract.

54.6 If the agreement is a contract as defined herein, the Contractor has filed prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in Section 54.9 below.

54.7 Every Contractor awarded a contract shall file with the Owner a statement of management as to whether the system of internal accounting controls of the Contractor and its subsidiaries reasonably assures that:

1. transactions are executed in accordance with management's general and specific authorization;
2. transactions are recorded as necessary:
 - i. to permit preparation of financial statements in conformity with generally accepted accounting principles, and
 - ii. to maintain accountability for assets;
3. access to assets is permitted only in accordance with management's general or specific authorization; and
4. the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

54.8 Every Contractor awarded a contract shall also file with the Owner a statement prepared and signed by an independent certified public accountant, stating that he has examined the statement of management on internal accounting controls, and expressing an opinion as to

1. whether the representations of management in response to this Section and Section 54.3 above are consistent with the result of management's evaluation of the system of internal accounting controls; and
2. whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

54.9 The Contractor shall annually file with the Division of Capital Asset Management and Maintenance during the term of the Contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant and a provide a copy of said

statement to the Owner. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report.

IN WITNESS THEREOF, the Contractor and the Owner have affixed their signatures on the dates written below.

APPROVED BY THE TOWN OF WINCHESTER:

Date: _____

Lisa Wong, Town Manager

APPROVED AS TO APPROPRIATION:

Date: _____

Stacie Ward, Comptroller

SIGNED:

[Contractor]

Date: _____

[Name]

[Title]

WAGE RATE AND COMPLIANCE FORMS



CHARLES D. BAKER
Governor

KARYN E. POLITO
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

**As determined by the Director under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H**

ROSALIN ACOSTA
Secretary

MICHAEL FLANAGAN
Interim Director

Awarding Authority: Town of Winchester

Contract Number:

City/Town: WINCHESTER

Description of Work: McCall Roadway Improvements Project includes: Demolition of pavement and curbing, new paving, curbing, rapid flashing beacon, signage, pavement markings, grading, drainage and loam and seed.

Job Location: Mystic Valley Parkway and Washington Street

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule from the Department of Labor Standards ("DLS") if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.**
- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule. Awarding authorities are required to request these updates no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F "rental of equipment" contracts.
- Every contractor or subcontractor which performs construction work on the project is required to submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. A sample of a payroll reporting form may be obtained at <http://www.mass.gov/dols/pw>.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
- Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2019	\$35.35	\$12.41	\$13.72	\$0.00	\$61.48
	06/01/2020	\$36.25	\$12.41	\$13.72	\$0.00	\$62.38
	08/01/2020	\$36.25	\$12.91	\$13.72	\$0.00	\$62.88
	12/01/2020	\$36.25	\$12.91	\$14.82	\$0.00	\$63.98
	06/01/2021	\$37.05	\$12.91	\$14.82	\$0.00	\$64.78
	08/01/2021	\$37.05	\$13.41	\$14.82	\$0.00	\$65.28
	12/01/2021	\$37.05	\$13.41	\$16.01	\$0.00	\$66.47
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2019	\$35.42	\$12.41	\$13.72	\$0.00	\$61.55
	06/01/2020	\$36.32	\$12.41	\$13.72	\$0.00	\$62.45
	08/01/2020	\$36.32	\$12.91	\$13.72	\$0.00	\$62.95
	12/01/2020	\$36.32	\$12.91	\$14.82	\$0.00	\$64.05
	06/01/2021	\$37.12	\$12.91	\$14.82	\$0.00	\$64.85
	08/01/2021	\$37.12	\$13.41	\$14.82	\$0.00	\$65.35
	12/01/2021	\$37.12	\$13.41	\$16.01	\$0.00	\$66.54
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2019	\$35.54	\$12.41	\$13.72	\$0.00	\$61.67
	06/01/2020	\$36.44	\$12.41	\$13.72	\$0.00	\$62.57
	08/01/2020	\$36.44	\$12.91	\$13.72	\$0.00	\$63.07
	12/01/2020	\$36.44	\$12.91	\$14.82	\$0.00	\$64.17
	06/01/2021	\$37.24	\$12.91	\$14.82	\$0.00	\$64.97
	08/01/2021	\$37.24	\$13.41	\$14.82	\$0.00	\$65.47
	12/01/2021	\$37.24	\$13.41	\$16.01	\$0.00	\$66.66
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2019	\$102.78	\$9.90	\$21.15	\$0.00	\$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.90	\$8.10	\$16.60	\$0.00	\$64.60
	06/01/2020	\$40.89	\$8.10	\$16.60	\$0.00	\$65.59
	12/01/2020	\$41.87	\$8.10	\$16.60	\$0.00	\$66.57
	06/01/2021	\$42.89	\$8.10	\$16.60	\$0.00	\$67.59
	12/01/2021	\$43.90	\$8.10	\$16.60	\$0.00	\$68.60
For apprentice rates see "Apprentice- LABORER"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	12/01/2019	\$37.00	\$12.50	\$8.85	\$0.00	\$58.35
	06/01/2020	\$38.00	\$12.50	\$8.85	\$0.00	\$59.35
	12/01/2020	\$39.00	\$12.50	\$8.85	\$0.00	\$60.35
ASPHALT RAKER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
	06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
	12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
	06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
	12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.90	\$8.10	\$16.60	\$0.00	\$64.60
	06/01/2020	\$40.89	\$8.10	\$16.60	\$0.00	\$65.59
	12/01/2020	\$41.87	\$8.10	\$16.60	\$0.00	\$66.57
	06/01/2021	\$42.89	\$8.10	\$16.60	\$0.00	\$67.59
	12/01/2021	\$43.90	\$8.10	\$16.60	\$0.00	\$68.60
For apprentice rates see "Apprentice- LABORER"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2020	\$46.10	\$7.07	\$17.98	\$0.00	\$71.15

Apprentice - BOILERMAKER - Local 29

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$29.97	\$7.07	\$11.69	\$0.00	\$48.73
2	65	\$29.97	\$7.07	\$11.69	\$0.00	\$48.73
3	70	\$32.27	\$7.07	\$12.59	\$0.00	\$51.93
4	75	\$34.58	\$7.07	\$13.49	\$0.00	\$55.14
5	80	\$36.88	\$7.07	\$14.38	\$0.00	\$58.33
6	85	\$39.19	\$7.07	\$15.29	\$0.00	\$61.55
7	90	\$41.49	\$7.07	\$16.18	\$0.00	\$64.74
8	95	\$43.80	\$7.07	\$17.09	\$0.00	\$67.96

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) <i>BRICKLAYERS LOCAL 3 (WALTHAM)</i>	02/01/2020	\$54.40	\$10.75	\$21.94	\$0.00	\$87.09
	08/01/2020	\$55.75	\$10.75	\$22.09	\$0.00	\$88.59
	02/01/2021	\$56.39	\$10.75	\$22.09	\$0.00	\$89.23
	08/01/2021	\$57.79	\$10.75	\$22.25	\$0.00	\$90.79
	02/01/2022	\$58.38	\$10.75	\$22.25	\$0.00	\$91.38

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
----------------	----------------	-----------	--------	---------	---------------------------	------------

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Waltham

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.20	\$10.75	\$21.94	\$0.00	\$59.89
2	60	\$32.64	\$10.75	\$21.94	\$0.00	\$65.33
3	70	\$38.08	\$10.75	\$21.94	\$0.00	\$70.77
4	80	\$43.52	\$10.75	\$21.94	\$0.00	\$76.21
5	90	\$48.96	\$10.75	\$21.94	\$0.00	\$81.65

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.88	\$10.75	\$22.09	\$0.00	\$60.72
2	60	\$33.45	\$10.75	\$22.09	\$0.00	\$66.29
3	70	\$39.03	\$10.75	\$22.09	\$0.00	\$71.87
4	80	\$44.60	\$10.75	\$22.09	\$0.00	\$77.44
5	90	\$50.18	\$10.75	\$22.09	\$0.00	\$83.02

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
OPERATING ENGINEERS LOCAL 4	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

CAISSON & UNDERPINNING BOTTOM MAN	12/01/2019	\$40.25	\$8.10	\$16.80	\$0.00	\$65.15
LABORERS - FOUNDATION AND MARINE	06/01/2020	\$41.24	\$8.10	\$16.80	\$0.00	\$66.14
	12/01/2020	\$42.22	\$8.10	\$16.80	\$0.00	\$67.12
	06/01/2021	\$43.24	\$8.10	\$16.80	\$0.00	\$68.14
	12/01/2021	\$44.25	\$8.10	\$16.80	\$0.00	\$69.15

For apprentice rates see "Apprentice- LABORER"

CAISSON & UNDERPINNING LABORER	12/01/2019	\$39.10	\$8.10	\$16.80	\$0.00	\$64.00
LABORERS - FOUNDATION AND MARINE	06/01/2020	\$40.09	\$8.10	\$16.80	\$0.00	\$64.99
	12/01/2020	\$41.07	\$8.10	\$16.80	\$0.00	\$65.97
	06/01/2021	\$42.09	\$8.10	\$16.80	\$0.00	\$66.99
	12/01/2021	\$43.10	\$8.10	\$16.80	\$0.00	\$68.00

For apprentice rates see "Apprentice- LABORER"

CAISSON & UNDERPINNING TOP MAN	12/01/2019	\$39.10	\$8.10	\$16.80	\$0.00	\$64.00
LABORERS - FOUNDATION AND MARINE	06/01/2020	\$40.09	\$8.10	\$16.80	\$0.00	\$64.99
	12/01/2020	\$41.07	\$8.10	\$16.80	\$0.00	\$65.97
	06/01/2021	\$42.09	\$8.10	\$16.80	\$0.00	\$66.99
	12/01/2021	\$43.10	\$8.10	\$16.80	\$0.00	\$68.00

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARBIDE CORE DRILL OPERATOR	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
LABORERS - ZONE 1	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10

For apprentice rates see "Apprentice- LABORER"

CARPENTER	03/01/2020	\$42.50	\$9.40	\$18.95	\$0.00	\$70.85
CARPENTERS -ZONE 2 (Eastern Massachusetts)	09/01/2020	\$43.15	\$9.40	\$18.95	\$0.00	\$71.50
	03/01/2021	\$43.75	\$9.40	\$18.95	\$0.00	\$72.10
	09/01/2021	\$44.40	\$9.40	\$18.95	\$0.00	\$72.75
	03/01/2022	\$45.00	\$9.40	\$18.95	\$0.00	\$73.35
	09/01/2022	\$45.65	\$9.40	\$18.95	\$0.00	\$74.00
	03/01/2023	\$46.25	\$9.40	\$18.95	\$0.00	\$74.60

Apprentice - CARPENTER - Zone 2 Eastern MA

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.25	\$9.40	\$1.73	\$0.00	\$32.38
2	60	\$25.50	\$9.40	\$1.73	\$0.00	\$36.63
3	70	\$29.75	\$9.40	\$13.76	\$0.00	\$52.91
4	75	\$31.88	\$9.40	\$13.76	\$0.00	\$55.04
5	80	\$34.00	\$9.40	\$15.49	\$0.00	\$58.89
6	80	\$34.00	\$9.40	\$15.49	\$0.00	\$58.89
7	90	\$38.25	\$9.40	\$17.22	\$0.00	\$64.87
8	90	\$38.25	\$9.40	\$17.22	\$0.00	\$64.87

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.58	\$9.40	\$1.73	\$0.00	\$32.71
2	60	\$25.89	\$9.40	\$1.73	\$0.00	\$37.02
3	70	\$30.21	\$9.40	\$13.76	\$0.00	\$53.37
4	75	\$32.36	\$9.40	\$13.76	\$0.00	\$55.52
5	80	\$34.52	\$9.40	\$15.49	\$0.00	\$59.41
6	80	\$34.52	\$9.40	\$15.49	\$0.00	\$59.41
7	90	\$38.84	\$9.40	\$17.22	\$0.00	\$65.46
8	90	\$38.84	\$9.40	\$17.22	\$0.00	\$65.46

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 \$30.26/ 3&4 \$36.18/ 5&6 \$54.64/ 7&8 \$60.62

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME	10/01/2019	\$27.95	\$7.07	\$7.86	\$0.00	\$42.88
CARPENTERS -ZONE 2 (Wood Frame)						

All Aspects of New Wood Frame Work

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
----------------	----------------	-----------	--------	---------	---------------------------	------------

Apprentice - CARPENTER (Wood Frame) - Zone 2

Effective Date - 10/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$16.77	\$7.07	\$0.00	\$0.00	\$23.84
2	60	\$16.77	\$7.07	\$0.00	\$0.00	\$23.84
3	65	\$18.17	\$7.07	\$7.86	\$0.00	\$33.10
4	70	\$19.57	\$7.07	\$7.86	\$0.00	\$34.50
5	75	\$20.96	\$7.07	\$7.86	\$0.00	\$35.89
6	80	\$22.36	\$7.07	\$7.86	\$0.00	\$37.29
7	85	\$23.76	\$7.07	\$7.86	\$0.00	\$38.69
8	90	\$25.16	\$7.07	\$7.86	\$0.00	\$40.09

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 \$19.65/ 3&4 \$27.19/ 5&6 \$34.50/ 7&8 \$37.29

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING BRICKLAYERS LOCAL 3 (WALTHAM)	01/01/2020	\$49.07	\$12.75	\$22.41	\$0.62	\$84.85
--	------------	---------	---------	---------	--------	---------

Apprentice - CEMENT MASONRY/PLASTERING - Eastern Mass (Waltham)

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.54	\$12.75	\$15.41	\$0.00	\$52.70
2	60	\$29.44	\$12.75	\$17.41	\$0.62	\$60.22
3	65	\$31.90	\$12.75	\$18.41	\$0.62	\$63.68
4	70	\$34.35	\$12.75	\$19.41	\$0.62	\$67.13
5	75	\$36.80	\$12.75	\$20.41	\$0.62	\$70.58
6	80	\$39.26	\$12.75	\$21.41	\$0.62	\$74.04
7	90	\$44.16	\$12.75	\$22.41	\$0.62	\$79.94

Notes:

Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR LABORERS - ZONE 1	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10

For apprentice rates see "Apprentice- LABORER"

CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES OPERATING ENGINEERS LOCAL 4	12/01/2019	\$49.73	\$12.50	\$15.70	\$0.00	\$77.93
	06/01/2020	\$50.83	\$12.50	\$15.70	\$0.00	\$79.03
	12/01/2020	\$51.98	\$12.50	\$15.70	\$0.00	\$80.18
	06/01/2021	\$53.08	\$12.50	\$15.70	\$0.00	\$81.28
	12/01/2021	\$54.23	\$12.50	\$15.70	\$0.00	\$82.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$32.47	\$12.50	\$15.70	\$0.00	\$60.67
	06/01/2020	\$33.22	\$12.50	\$15.70	\$0.00	\$61.42
	12/01/2020	\$34.00	\$12.50	\$15.70	\$0.00	\$62.20
	06/01/2021	\$34.75	\$12.50	\$15.70	\$0.00	\$62.95
	12/01/2021	\$35.54	\$12.50	\$15.70	\$0.00	\$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2020	\$50.96	\$8.20	\$22.10	\$0.00	\$81.26
	07/01/2020	\$52.06	\$8.20	\$22.10	\$0.00	\$82.36
	01/01/2021	\$53.16	\$8.20	\$22.10	\$0.00	\$83.46

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.48	\$8.20	\$0.00	\$0.00	\$33.68
2	55	\$28.03	\$8.20	\$5.94	\$0.00	\$42.17
3	60	\$30.58	\$8.20	\$6.48	\$0.00	\$45.26
4	65	\$33.12	\$8.20	\$7.02	\$0.00	\$48.34
5	70	\$35.67	\$8.20	\$18.86	\$0.00	\$62.73
6	75	\$38.22	\$8.20	\$19.40	\$0.00	\$65.82
7	80	\$40.77	\$8.20	\$19.94	\$0.00	\$68.91
8	90	\$45.86	\$8.20	\$21.02	\$0.00	\$75.08

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.03	\$8.20	\$0.00	\$0.00	\$34.23
2	55	\$28.63	\$8.20	\$5.94	\$0.00	\$42.77
3	60	\$31.24	\$8.20	\$6.48	\$0.00	\$45.92
4	65	\$33.84	\$8.20	\$7.02	\$0.00	\$49.06
5	70	\$36.44	\$8.20	\$18.86	\$0.00	\$63.50
6	75	\$39.05	\$8.20	\$19.40	\$0.00	\$66.65
7	80	\$41.65	\$8.20	\$19.94	\$0.00	\$69.79
8	90	\$46.85	\$8.20	\$21.02	\$0.00	\$76.07

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.30	\$8.10	\$16.60	\$0.00	\$64.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$40.30	\$8.10	\$16.60	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS <i>LABORERS - ZONE 1</i>	12/01/2019	\$40.05	\$8.10	\$16.60	\$0.00	\$64.75
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: CONCRETE CUTTER/SAWYER <i>LABORERS - ZONE 1</i>	12/01/2019	\$40.30	\$8.10	\$16.60	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$40.05	\$8.10	\$16.60	\$0.00	\$64.75
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.30	\$8.10	\$16.60	\$0.00	\$64.00
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2019	\$68.52	\$9.90	\$21.15	\$0.00	\$99.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2019	\$73.41	\$9.90	\$21.15	\$0.00	\$104.46
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2019	\$102.78	\$9.90	\$21.15	\$0.00	\$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) <i>ELECTRICIANS LOCAL 103</i>	03/01/2020	\$53.50	\$13.00	\$19.20	\$0.00	\$85.70
	09/01/2020	\$54.93	\$13.00	\$19.25	\$0.00	\$87.18
	03/01/2021	\$56.13	\$13.00	\$19.28	\$0.00	\$88.41
	09/01/2021	\$57.56	\$13.00	\$19.33	\$0.00	\$89.89
	03/01/2022	\$58.76	\$13.00	\$19.36	\$0.00	\$91.12
	09/01/2022	\$60.19	\$13.00	\$19.41	\$0.00	\$92.60
	03/01/2023	\$61.39	\$13.00	\$19.44	\$0.00	\$93.83
For apprentice rates see "Apprentice- ELECTRICIAN"						
ELECTRICIAN <i>ELECTRICIANS LOCAL 103</i>	03/01/2020	\$53.50	\$13.00	\$19.20	\$0.00	\$85.70
	09/01/2020	\$54.93	\$13.00	\$19.25	\$0.00	\$87.18
	03/01/2021	\$56.13	\$13.00	\$19.28	\$0.00	\$88.41
	09/01/2021	\$57.56	\$13.00	\$19.33	\$0.00	\$89.89
	03/01/2022	\$58.76	\$13.00	\$19.36	\$0.00	\$91.12
	09/01/2022	\$60.19	\$13.00	\$19.41	\$0.00	\$92.60
	03/01/2023	\$61.39	\$13.00	\$19.44	\$0.00	\$93.83

Classification

**Effective Date Base Wage Health Pension Supplemental
Unemployment Total Rate**

Apprentice - *ELECTRICIAN - Local 103*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$21.40	\$13.00	\$0.64	\$0.00	\$35.04
2	40	\$21.40	\$13.00	\$0.64	\$0.00	\$35.04
3	45	\$24.08	\$13.00	\$14.62	\$0.00	\$51.70
4	45	\$24.08	\$13.00	\$14.62	\$0.00	\$51.70
5	50	\$26.75	\$13.00	\$15.04	\$0.00	\$54.79
6	55	\$29.43	\$13.00	\$15.46	\$0.00	\$57.89
7	60	\$32.10	\$13.00	\$15.87	\$0.00	\$60.97
8	65	\$34.78	\$13.00	\$16.29	\$0.00	\$64.07
9	70	\$37.45	\$13.00	\$16.70	\$0.00	\$67.15
10	75	\$40.13	\$13.00	\$17.12	\$0.00	\$70.25

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$21.97	\$13.00	\$0.66	\$0.00	\$35.63
2	40	\$21.97	\$13.00	\$0.66	\$0.00	\$35.63
3	45	\$24.72	\$13.00	\$14.64	\$0.00	\$52.36
4	45	\$24.72	\$13.00	\$14.64	\$0.00	\$52.36
5	50	\$27.47	\$13.00	\$15.06	\$0.00	\$55.53
6	55	\$30.21	\$13.00	\$15.49	\$0.00	\$58.70
7	60	\$32.96	\$13.00	\$15.90	\$0.00	\$61.86
8	65	\$35.70	\$13.00	\$16.32	\$0.00	\$65.02
9	70	\$38.45	\$13.00	\$16.73	\$0.00	\$68.18
10	75	\$41.20	\$13.00	\$17.16	\$0.00	\$71.36

Notes: :

App Prior 1/1/03; 30/35/40/45/50/55/65/70/75/80

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR	01/01/2020	\$61.42	\$15.73	\$18.41	\$0.00	\$95.56
ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2021	\$63.47	\$15.88	\$19.31	\$0.00	\$98.66
	01/01/2022	\$65.62	\$16.03	\$20.21	\$0.00	\$101.86

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
----------------	----------------	-----------	--------	---------	------------------------------	------------

Apprentice - ELEVATOR CONSTRUCTOR - Local 4

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.71	\$15.73	\$0.00	\$0.00	\$46.44
2	55	\$33.78	\$15.73	\$18.41	\$0.00	\$67.92
3	65	\$39.92	\$15.73	\$18.41	\$0.00	\$74.06
4	70	\$42.99	\$15.73	\$18.41	\$0.00	\$77.13
5	80	\$49.14	\$15.73	\$18.41	\$0.00	\$83.28

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.74	\$15.88	\$0.00	\$0.00	\$47.62
2	55	\$34.91	\$15.88	\$19.31	\$0.00	\$70.10
3	65	\$41.26	\$15.88	\$19.31	\$0.00	\$76.45
4	70	\$44.43	\$15.88	\$19.31	\$0.00	\$79.62
5	80	\$50.78	\$15.88	\$19.31	\$0.00	\$85.97

Notes:

Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER	01/01/2020	\$42.99	\$15.73	\$18.41	\$0.00	\$77.13
ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2021	\$44.43	\$15.88	\$19.31	\$0.00	\$79.62
	01/01/2022	\$45.93	\$16.03	\$20.21	\$0.00	\$82.17
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
LABORERS - ZONE 1	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY	11/01/2019	\$44.18	\$12.00	\$15.60	\$0.00	\$71.78
OPERATING ENGINEERS LOCAL 4	05/01/2020	\$45.33	\$12.00	\$15.60	\$0.00	\$72.93
	11/01/2020	\$46.33	\$12.00	\$15.60	\$0.00	\$73.93
	05/01/2021	\$47.48	\$12.00	\$15.60	\$0.00	\$75.08
	11/01/2021	\$48.48	\$12.00	\$15.60	\$0.00	\$76.08
	05/01/2022	\$49.63	\$12.00	\$15.60	\$0.00	\$77.23
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY	11/01/2019	\$45.68	\$12.00	\$15.60	\$0.00	\$73.28
OPERATING ENGINEERS LOCAL 4	05/01/2020	\$46.83	\$12.00	\$15.60	\$0.00	\$74.43
	11/01/2020	\$47.84	\$12.00	\$15.60	\$0.00	\$75.44
	05/01/2021	\$49.00	\$12.00	\$15.60	\$0.00	\$76.60
	11/01/2021	\$50.01	\$12.00	\$15.60	\$0.00	\$77.61
	05/01/2022	\$51.17	\$12.00	\$15.60	\$0.00	\$78.77
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2019	\$22.57	\$12.00	\$15.60	\$0.00	\$50.17
	05/01/2020	\$23.24	\$12.00	\$15.60	\$0.00	\$50.84
	11/01/2020	\$23.83	\$12.00	\$15.60	\$0.00	\$51.43
	05/01/2021	\$24.51	\$12.00	\$15.60	\$0.00	\$52.11
	11/01/2021	\$25.11	\$12.00	\$15.60	\$0.00	\$52.71
	05/01/2022	\$25.78	\$12.00	\$15.60	\$0.00	\$53.38
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 103</i>	03/01/2020	\$53.50	\$13.00	\$19.20	\$0.00	\$85.70
	09/01/2020	\$54.93	\$13.00	\$19.25	\$0.00	\$87.18
	03/01/2021	\$56.13	\$13.00	\$19.28	\$0.00	\$88.41
	09/01/2021	\$57.56	\$13.00	\$19.33	\$0.00	\$89.89
	03/01/2022	\$58.76	\$13.00	\$19.36	\$0.00	\$91.12
	09/01/2022	\$60.19	\$13.00	\$19.41	\$0.00	\$92.60
	03/01/2023	\$61.39	\$13.00	\$19.44	\$0.00	\$93.83
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS LOCAL 103</i>	03/01/2020	\$40.13	\$13.00	\$17.12	\$0.00	\$70.25
	09/01/2020	\$41.20	\$13.00	\$17.16	\$0.00	\$71.36
	03/01/2021	\$42.66	\$13.00	\$17.27	\$0.00	\$72.93
	09/01/2021	\$44.32	\$13.00	\$17.38	\$0.00	\$74.70
	03/01/2022	\$45.83	\$13.00	\$17.49	\$0.00	\$76.32
	09/01/2022	\$47.55	\$13.00	\$17.62	\$0.00	\$78.17
	03/01/2023	\$49.11	\$13.00	\$17.73	\$0.00	\$79.84
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$39.89	\$12.50	\$15.70	\$0.00	\$68.09
	06/01/2020	\$40.80	\$12.50	\$15.70	\$0.00	\$69.00
	12/01/2020	\$41.75	\$12.50	\$15.70	\$0.00	\$69.95
	06/01/2021	\$42.66	\$12.50	\$15.70	\$0.00	\$70.86
	12/01/2021	\$43.61	\$12.50	\$15.70	\$0.00	\$71.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER <i>LABORERS - ZONE 1</i>	12/01/2019	\$23.50	\$8.10	\$16.60	\$0.00	\$48.20
	06/01/2020	\$23.50	\$8.10	\$16.60	\$0.00	\$48.20
	12/01/2020	\$24.50	\$8.10	\$16.60	\$0.00	\$49.20
	06/01/2021	\$24.50	\$8.10	\$16.60	\$0.00	\$49.20
	12/01/2021	\$24.50	\$8.10	\$16.60	\$0.00	\$49.20
For apprentice rates see "Apprentice- LABORER"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE 1</i>	03/01/2020	\$47.05	\$9.40	\$19.25	\$0.00	\$75.70
	09/01/2020	\$47.85	\$9.40	\$19.25	\$0.00	\$76.50
	03/01/2021	\$48.65	\$9.40	\$19.25	\$0.00	\$77.30
	09/01/2021	\$49.45	\$9.40	\$19.25	\$0.00	\$78.10
	03/01/2022	\$50.25	\$9.40	\$19.25	\$0.00	\$78.90

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - FLOORCOVERER - Local 2168 Zone I
Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.53	\$9.40	\$1.79	\$0.00	\$34.72
2	55	\$25.88	\$9.40	\$1.79	\$0.00	\$37.07
3	60	\$28.23	\$9.40	\$13.88	\$0.00	\$51.51
4	65	\$30.58	\$9.40	\$13.88	\$0.00	\$53.86
5	70	\$32.94	\$9.40	\$15.67	\$0.00	\$58.01
6	75	\$35.29	\$9.40	\$15.67	\$0.00	\$60.36
7	80	\$37.64	\$9.40	\$17.46	\$0.00	\$64.50
8	85	\$39.99	\$9.40	\$17.46	\$0.00	\$66.85

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.93	\$9.40	\$1.79	\$0.00	\$35.12
2	55	\$26.32	\$9.40	\$1.79	\$0.00	\$37.51
3	60	\$28.71	\$9.40	\$13.88	\$0.00	\$51.99
4	65	\$31.10	\$9.40	\$13.88	\$0.00	\$54.38
5	70	\$33.50	\$9.40	\$15.67	\$0.00	\$58.57
6	75	\$35.89	\$9.40	\$15.67	\$0.00	\$60.96
7	80	\$38.28	\$9.40	\$17.46	\$0.00	\$65.14
8	85	\$40.67	\$9.40	\$17.46	\$0.00	\$67.53

Notes: Steps are 750 hrs.
 % After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
 Step 1&2 \$32.36/ 3&4 \$38.80/ 5&6 \$58.01/ 7&8 \$64.50

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
	06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
	12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$32.47	\$12.50	\$15.70	\$0.00	\$60.67
	06/01/2020	\$33.22	\$12.50	\$15.70	\$0.00	\$61.42
	12/01/2020	\$34.00	\$12.50	\$15.70	\$0.00	\$62.20
	06/01/2021	\$34.75	\$12.50	\$15.70	\$0.00	\$62.95
	12/01/2021	\$35.54	\$12.50	\$15.70	\$0.00	\$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 2)</i>	01/01/2020	\$40.46	\$8.20	\$22.10	\$0.00	\$70.76
	07/01/2020	\$41.56	\$8.20	\$22.10	\$0.00	\$71.86
	01/01/2021	\$42.66	\$8.20	\$22.10	\$0.00	\$72.96

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - GLAZIER - Local 35 Zone 2
Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.23	\$8.20	\$0.00	\$0.00	\$28.43
2	55	\$22.25	\$8.20	\$5.94	\$0.00	\$36.39
3	60	\$24.28	\$8.20	\$6.48	\$0.00	\$38.96
4	65	\$26.30	\$8.20	\$7.02	\$0.00	\$41.52
5	70	\$28.32	\$8.20	\$18.86	\$0.00	\$55.38
6	75	\$30.35	\$8.20	\$19.40	\$0.00	\$57.95
7	80	\$32.37	\$8.20	\$19.94	\$0.00	\$60.51
8	90	\$36.41	\$8.20	\$21.02	\$0.00	\$65.63

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.78	\$8.20	\$0.00	\$0.00	\$28.98
2	55	\$22.86	\$8.20	\$5.94	\$0.00	\$37.00
3	60	\$24.94	\$8.20	\$6.48	\$0.00	\$39.62
4	65	\$27.01	\$8.20	\$7.02	\$0.00	\$42.23
5	70	\$29.09	\$8.20	\$18.86	\$0.00	\$56.15
6	75	\$31.17	\$8.20	\$19.40	\$0.00	\$58.77
7	80	\$33.25	\$8.20	\$19.94	\$0.00	\$61.39
8	90	\$37.40	\$8.20	\$21.02	\$0.00	\$66.62

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1
HOISTING ENGINEER/CRANES/GRADALLS
OPERATING ENGINEERS LOCAL 4

12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - OPERATING ENGINEERS - Local 4
Effective Date - 12/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$26.80	\$12.50	\$0.00	\$0.00	\$39.30
2	60	\$29.24	\$12.50	\$15.70	\$0.00	\$57.44
3	65	\$31.67	\$12.50	\$15.70	\$0.00	\$59.87
4	70	\$34.11	\$12.50	\$15.70	\$0.00	\$62.31
5	75	\$36.55	\$12.50	\$15.70	\$0.00	\$64.75
6	80	\$38.98	\$12.50	\$15.70	\$0.00	\$67.18
7	85	\$41.42	\$12.50	\$15.70	\$0.00	\$69.62
8	90	\$43.86	\$12.50	\$15.70	\$0.00	\$72.06

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$27.41	\$12.50	\$0.00	\$0.00	\$39.91
2	60	\$29.90	\$12.50	\$15.70	\$0.00	\$58.10
3	65	\$32.39	\$12.50	\$15.70	\$0.00	\$60.59
4	70	\$34.88	\$12.50	\$15.70	\$0.00	\$63.08
5	75	\$37.37	\$12.50	\$15.70	\$0.00	\$65.57
6	80	\$39.86	\$12.50	\$15.70	\$0.00	\$68.06
7	85	\$42.36	\$12.50	\$15.70	\$0.00	\$70.56
8	90	\$44.85	\$12.50	\$15.70	\$0.00	\$73.05

Notes:
Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK)	02/01/2020	\$49.36	\$13.35	\$24.12	\$2.61	\$89.44
SHEETMETAL WORKERS LOCAL 17 - A	08/01/2020	\$50.96	\$13.35	\$24.12	\$2.66	\$91.09
	02/01/2021	\$52.61	\$13.35	\$24.12	\$2.71	\$92.79
	08/01/2021	\$54.36	\$13.35	\$24.12	\$2.76	\$94.59
	02/01/2022	\$56.11	\$13.35	\$24.12	\$2.81	\$96.39

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS)	03/01/2020	\$53.50	\$13.00	\$19.20	\$0.00	\$85.70
ELECTRICIANS LOCAL 103	09/01/2020	\$54.93	\$13.00	\$19.25	\$0.00	\$87.18
	03/01/2021	\$56.13	\$13.00	\$19.28	\$0.00	\$88.41
	09/01/2021	\$57.56	\$13.00	\$19.33	\$0.00	\$89.89
	03/01/2022	\$58.76	\$13.00	\$19.36	\$0.00	\$91.12
	09/01/2022	\$60.19	\$13.00	\$19.41	\$0.00	\$92.60
	03/01/2023	\$61.39	\$13.00	\$19.44	\$0.00	\$93.83

For apprentice rates see "Apprentice- ELECTRICIAN"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2020	\$49.36	\$13.35	\$24.12	\$2.61	\$89.44
	08/01/2020	\$50.96	\$13.35	\$24.12	\$2.66	\$91.09
	02/01/2021	\$52.61	\$13.35	\$24.12	\$2.71	\$92.79
	08/01/2021	\$54.36	\$13.35	\$24.12	\$2.76	\$94.59
	02/01/2022	\$56.11	\$13.35	\$24.12	\$2.81	\$96.39
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) <i>PIPEFITTERS LOCAL 537</i>	03/01/2020	\$56.19	\$10.95	\$19.74	\$0.00	\$86.88
	09/01/2020	\$57.69	\$10.95	\$19.74	\$0.00	\$88.38
	03/01/2021	\$59.19	\$10.95	\$19.74	\$0.00	\$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PIPEFITTERS LOCAL 537</i>	03/01/2020	\$56.19	\$10.95	\$19.74	\$0.00	\$86.88
	09/01/2020	\$57.69	\$10.95	\$19.74	\$0.00	\$88.38
	03/01/2021	\$59.19	\$10.95	\$19.74	\$0.00	\$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.90	\$8.10	\$16.60	\$0.00	\$64.60
	06/01/2020	\$40.89	\$8.10	\$16.60	\$0.00	\$65.59
	12/01/2020	\$41.87	\$8.10	\$16.60	\$0.00	\$66.57
	06/01/2021	\$42.89	\$8.10	\$16.60	\$0.00	\$67.59
	12/01/2021	\$43.90	\$8.10	\$16.60	\$0.00	\$68.60
For apprentice rates see "Apprentice- LABORER"						
INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	09/01/2019	\$48.44	\$12.80	\$16.40	\$0.00	\$77.64

Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.22	\$12.80	\$11.90	\$0.00	\$48.92
2	60	\$29.06	\$12.80	\$12.80	\$0.00	\$54.66
3	70	\$33.91	\$12.80	\$13.70	\$0.00	\$60.41
4	80	\$38.75	\$12.80	\$14.60	\$0.00	\$66.15

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER <i>IRONWORKERS LOCAL 7 (BOSTON AREA)</i>	03/16/2019	\$46.66	\$8.00	\$23.50	\$0.00	\$78.16
---	------------	---------	--------	---------	--------	---------

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - IRONWORKER - Local 7 Boston
Effective Date - 03/16/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$28.00	\$8.00	\$23.50	\$0.00	\$59.50
2	70	\$32.66	\$8.00	\$23.50	\$0.00	\$64.16
3	75	\$35.00	\$8.00	\$23.50	\$0.00	\$66.50
4	80	\$37.33	\$8.00	\$23.50	\$0.00	\$68.83
5	85	\$39.66	\$8.00	\$23.50	\$0.00	\$71.16
6	90	\$41.99	\$8.00	\$23.50	\$0.00	\$73.49

Notes:

** Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:**
JACKHAMMER & PAVING BREAKER OPERATOR

LABORERS - ZONE 1

12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10

For apprentice rates see "Apprentice- LABORER"

LABORER

LABORERS - ZONE 1

12/01/2019	\$39.15	\$8.10	\$16.60	\$0.00	\$63.85
06/01/2020	\$40.14	\$8.10	\$16.60	\$0.00	\$64.84
12/01/2020	\$41.12	\$8.10	\$16.60	\$0.00	\$65.82
06/01/2021	\$42.14	\$8.10	\$16.60	\$0.00	\$66.84
12/01/2021	\$43.15	\$8.10	\$16.60	\$0.00	\$67.85

Apprentice - LABORER - Zone 1
Effective Date - 12/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.49	\$8.10	\$16.60	\$0.00	\$48.19
2	70	\$27.41	\$8.10	\$16.60	\$0.00	\$52.11
3	80	\$31.32	\$8.10	\$16.60	\$0.00	\$56.02
4	90	\$35.24	\$8.10	\$16.60	\$0.00	\$59.94

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$24.08	\$8.10	\$16.60	\$0.00	\$48.78
2	70	\$28.10	\$8.10	\$16.60	\$0.00	\$52.80
3	80	\$32.11	\$8.10	\$16.60	\$0.00	\$56.81
4	90	\$36.13	\$8.10	\$16.60	\$0.00	\$60.83

Notes:
Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CARPENTER TENDER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.15	\$8.10	\$16.60	\$0.00	\$63.85
	06/01/2020	\$40.14	\$8.10	\$16.60	\$0.00	\$64.84
	12/01/2020	\$41.12	\$8.10	\$16.60	\$0.00	\$65.82
	06/01/2021	\$42.14	\$8.10	\$16.60	\$0.00	\$66.84
	12/01/2021	\$43.15	\$8.10	\$16.60	\$0.00	\$67.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.15	\$8.10	\$16.60	\$0.00	\$63.85
	06/01/2020	\$40.14	\$8.10	\$16.60	\$0.00	\$64.84
	12/01/2020	\$41.12	\$8.10	\$16.60	\$0.00	\$65.82
	06/01/2021	\$42.14	\$8.10	\$16.60	\$0.00	\$66.84
	12/01/2021	\$43.15	\$8.10	\$16.60	\$0.00	\$67.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.30	\$8.10	\$16.60	\$0.00	\$64.00
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.15	\$8.10	\$16.60	\$0.00	\$63.85
	06/01/2020	\$40.14	\$8.10	\$16.60	\$0.00	\$64.84
	12/01/2020	\$41.12	\$8.10	\$16.60	\$0.00	\$65.82
	06/01/2021	\$42.14	\$8.10	\$16.60	\$0.00	\$66.84
	12/01/2021	\$43.15	\$8.10	\$16.60	\$0.00	\$67.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.15	\$8.10	\$16.60	\$0.00	\$63.85
	06/01/2020	\$40.14	\$8.10	\$16.60	\$0.00	\$64.84
	12/01/2020	\$41.12	\$8.10	\$16.60	\$0.00	\$65.82
	06/01/2021	\$42.14	\$8.10	\$16.60	\$0.00	\$66.84
	12/01/2021	\$43.15	\$8.10	\$16.60	\$0.00	\$67.85
This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2020	\$41.49	\$10.75	\$20.12	\$0.00	\$72.36
	08/01/2020	\$42.57	\$10.75	\$20.27	\$0.00	\$73.59
	02/01/2021	\$43.08	\$10.75	\$20.27	\$0.00	\$74.10
	08/01/2021	\$44.20	\$10.75	\$20.43	\$0.00	\$75.38
	02/01/2022	\$44.67	\$10.75	\$20.43	\$0.00	\$75.85

Classification

**Effective Date Base Wage Health Pension Supplemental
Unemployment Total Rate**

Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.75	\$10.75	\$20.12	\$0.00	\$51.62
2	60	\$24.89	\$10.75	\$20.12	\$0.00	\$55.76
3	70	\$29.04	\$10.75	\$20.12	\$0.00	\$59.91
4	80	\$33.19	\$10.75	\$20.12	\$0.00	\$64.06
5	90	\$37.34	\$10.75	\$20.12	\$0.00	\$68.21

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.29	\$10.75	\$20.27	\$0.00	\$52.31
2	60	\$25.54	\$10.75	\$20.27	\$0.00	\$56.56
3	70	\$29.80	\$10.75	\$20.27	\$0.00	\$60.82
4	80	\$34.06	\$10.75	\$20.27	\$0.00	\$65.08
5	90	\$38.31	\$10.75	\$20.27	\$0.00	\$69.33

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS,TILELAYERS & TERRAZZO MECH	02/01/2020	\$54.42	\$10.75	\$21.93	\$0.00	\$87.10
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2020	\$55.77	\$10.75	\$22.08	\$0.00	\$88.60
	02/01/2021	\$56.41	\$10.75	\$22.08	\$0.00	\$89.24
	08/01/2021	\$57.81	\$10.75	\$22.24	\$0.00	\$90.80
	02/01/2022	\$58.38	\$10.75	\$22.24	\$0.00	\$91.37

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
----------------	----------------	-----------	--------	---------	---------------------------	------------

Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.21	\$10.75	\$21.93	\$0.00	\$59.89
2	60	\$32.65	\$10.75	\$21.93	\$0.00	\$65.33
3	70	\$38.09	\$10.75	\$21.93	\$0.00	\$70.77
4	80	\$43.54	\$10.75	\$21.93	\$0.00	\$76.22
5	90	\$48.98	\$10.75	\$21.93	\$0.00	\$81.66

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.89	\$10.75	\$22.08	\$0.00	\$60.72
2	60	\$33.46	\$10.75	\$22.08	\$0.00	\$66.29
3	70	\$39.04	\$10.75	\$22.08	\$0.00	\$71.87
4	80	\$44.62	\$10.75	\$22.08	\$0.00	\$77.45
5	90	\$50.19	\$10.75	\$22.08	\$0.00	\$83.02

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES)	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
OPERATING ENGINEERS LOCAL 4	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
OPERATING ENGINEERS LOCAL 4	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 1)	04/01/2019	\$42.22	\$9.90	\$18.50	\$0.00	\$70.62
MILLWRIGHTS LOCAL 1121 - Zone 1						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
----------------	----------------	-----------	--------	---------	------------------------------	------------

Apprentice - MILLWRIGHT - Local 1121 Zone 1

Effective Date - 04/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$23.22	\$9.90	\$5.31	\$0.00	\$38.43
2	65	\$27.44	\$9.90	\$15.13	\$0.00	\$52.47
3	75	\$31.67	\$9.90	\$16.10	\$0.00	\$57.67
4	85	\$35.89	\$9.90	\$17.06	\$0.00	\$62.85

Notes:

Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

MORTAR MIXER LABORERS - ZONE 1	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10

For apprentice rates see "Apprentice- LABORER"

OILER (OTHER THAN TRUCK CRANES,GRADALLS) OPERATING ENGINEERS LOCAL 4	12/01/2019	\$23.08	\$12.50	\$15.70	\$0.00	\$51.28
	06/01/2020	\$23.63	\$12.50	\$15.70	\$0.00	\$51.83
	12/01/2020	\$24.20	\$12.50	\$15.70	\$0.00	\$52.40
	06/01/2021	\$24.75	\$12.50	\$15.70	\$0.00	\$52.95
	12/01/2021	\$25.33	\$12.50	\$15.70	\$0.00	\$53.53

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OILER (TRUCK CRANES, GRADALLS) OPERATING ENGINEERS LOCAL 4	12/01/2019	\$27.64	\$12.50	\$15.70	\$0.00	\$55.84
	06/01/2020	\$28.29	\$12.50	\$15.70	\$0.00	\$56.49
	12/01/2020	\$28.97	\$12.50	\$15.70	\$0.00	\$57.17
	06/01/2021	\$29.61	\$12.50	\$15.70	\$0.00	\$57.81
	12/01/2021	\$30.29	\$12.50	\$15.70	\$0.00	\$58.49

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OTHER POWER DRIVEN EQUIPMENT - CLASS II OPERATING ENGINEERS LOCAL 4	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 - ZONE 2	01/01/2020	\$50.96	\$8.20	\$22.10	\$0.00	\$81.26
	07/01/2020	\$52.06	\$8.20	\$22.10	\$0.00	\$82.36
	01/01/2021	\$53.16	\$8.20	\$22.10	\$0.00	\$83.46

Apprentice - PAINTER Local 35 - BRIDGES/TANKS**Effective Date - 01/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.48	\$8.20	\$0.00	\$0.00	\$33.68
2	55	\$28.03	\$8.20	\$5.94	\$0.00	\$42.17
3	60	\$30.58	\$8.20	\$6.48	\$0.00	\$45.26
4	65	\$33.12	\$8.20	\$7.02	\$0.00	\$48.34
5	70	\$35.67	\$8.20	\$18.86	\$0.00	\$62.73
6	75	\$38.22	\$8.20	\$19.40	\$0.00	\$65.82
7	80	\$40.77	\$8.20	\$19.94	\$0.00	\$68.91
8	90	\$45.86	\$8.20	\$21.02	\$0.00	\$75.08

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.03	\$8.20	\$0.00	\$0.00	\$34.23
2	55	\$28.63	\$8.20	\$5.94	\$0.00	\$42.77
3	60	\$31.24	\$8.20	\$6.48	\$0.00	\$45.92
4	65	\$33.84	\$8.20	\$7.02	\$0.00	\$49.06
5	70	\$36.44	\$8.20	\$18.86	\$0.00	\$63.50
6	75	\$39.05	\$8.20	\$19.40	\$0.00	\$66.65
7	80	\$41.65	\$8.20	\$19.94	\$0.00	\$69.79
8	90	\$46.85	\$8.20	\$21.02	\$0.00	\$76.07

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SIGN, PICTORIAL & DISPLAY)

06/01/2013

\$25.81

\$7.07

\$7.05

\$0.00

\$39.93

PAINTERS LOCAL 35 - ZONE 2

Classification

**Effective Date Base Wage Health Pension Supplemental
Unemployment Total Rate**

Apprentice - PAINTER SIGN - Local 35 Zone 2

Effective Date - 06/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$12.91	\$7.07	\$0.00	\$0.00	\$19.98
2	55	\$14.20	\$7.07	\$2.45	\$0.00	\$23.72
3	60	\$15.49	\$7.07	\$2.45	\$0.00	\$25.01
4	65	\$16.78	\$7.07	\$2.45	\$0.00	\$26.30
5	70	\$18.07	\$7.07	\$7.05	\$0.00	\$32.19
6	75	\$19.36	\$7.07	\$7.05	\$0.00	\$33.48
7	80	\$20.65	\$7.07	\$7.05	\$0.00	\$34.77
8	85	\$21.94	\$7.07	\$7.05	\$0.00	\$36.06
9	90	\$23.23	\$7.07	\$7.05	\$0.00	\$37.35

Notes:

Steps are 4 mos.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2020	\$41.86	\$8.20	\$22.10	\$0.00	\$72.16
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2	07/01/2020	\$42.96	\$8.20	\$22.10	\$0.00	\$73.26
	01/01/2021	\$44.06	\$8.20	\$22.10	\$0.00	\$74.36

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.93	\$8.20	\$0.00	\$0.00	\$29.13
2	55	\$23.02	\$8.20	\$5.94	\$0.00	\$37.16
3	60	\$25.12	\$8.20	\$6.48	\$0.00	\$39.80
4	65	\$27.21	\$8.20	\$7.02	\$0.00	\$42.43
5	70	\$29.30	\$8.20	\$18.86	\$0.00	\$56.36
6	75	\$31.40	\$8.20	\$19.40	\$0.00	\$59.00
7	80	\$33.49	\$8.20	\$19.94	\$0.00	\$61.63
8	90	\$37.67	\$8.20	\$21.02	\$0.00	\$66.89

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.48	\$8.20	\$0.00	\$0.00	\$29.68
2	55	\$23.63	\$8.20	\$5.94	\$0.00	\$37.77
3	60	\$25.78	\$8.20	\$6.48	\$0.00	\$40.46
4	65	\$27.92	\$8.20	\$7.02	\$0.00	\$43.14
5	70	\$30.07	\$8.20	\$18.86	\$0.00	\$57.13
6	75	\$32.22	\$8.20	\$19.40	\$0.00	\$59.82
7	80	\$34.37	\$8.20	\$19.94	\$0.00	\$62.51
8	90	\$38.66	\$8.20	\$21.02	\$0.00	\$67.88

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2020	\$39.92	\$8.20	\$22.10	\$0.00	\$70.22
PAINTERS LOCAL 35 - ZONE 2	07/01/2020	\$41.02	\$8.20	\$22.10	\$0.00	\$71.32
	01/01/2021	\$42.12	\$8.20	\$22.10	\$0.00	\$72.42

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint
Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.96	\$8.20	\$0.00	\$0.00	\$28.16
2	55	\$21.96	\$8.20	\$5.94	\$0.00	\$36.10
3	60	\$23.95	\$8.20	\$6.48	\$0.00	\$38.63
4	65	\$25.95	\$8.20	\$7.02	\$0.00	\$41.17
5	70	\$27.94	\$8.20	\$18.86	\$0.00	\$55.00
6	75	\$29.94	\$8.20	\$19.40	\$0.00	\$57.54
7	80	\$31.94	\$8.20	\$19.94	\$0.00	\$60.08
8	90	\$35.93	\$8.20	\$21.02	\$0.00	\$65.15

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.51	\$8.20	\$0.00	\$0.00	\$28.71
2	55	\$22.56	\$8.20	\$5.94	\$0.00	\$36.70
3	60	\$24.61	\$8.20	\$6.48	\$0.00	\$39.29
4	65	\$26.66	\$8.20	\$7.02	\$0.00	\$41.88
5	70	\$28.71	\$8.20	\$18.86	\$0.00	\$55.77
6	75	\$30.77	\$8.20	\$19.40	\$0.00	\$58.37
7	80	\$32.82	\$8.20	\$19.94	\$0.00	\$60.96
8	90	\$36.92	\$8.20	\$21.02	\$0.00	\$66.14

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (TRAFFIC MARKINGS)

LABORERS - ZONE 1

12/01/2019	\$39.15	\$8.10	\$16.60	\$0.00	\$63.85
06/01/2020	\$40.14	\$8.10	\$16.60	\$0.00	\$64.84
12/01/2020	\$41.12	\$8.10	\$16.60	\$0.00	\$65.82
06/01/2021	\$42.14	\$8.10	\$16.60	\$0.00	\$66.84
12/01/2021	\$43.15	\$8.10	\$16.60	\$0.00	\$67.85

For Apprentice rates see "Apprentice- LABORER"

PAINTER / TAPER (BRUSH, NEW) *

* If 30% or more of surfaces to be painted are new construction,

NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2

01/01/2020	\$40.46	\$8.20	\$22.10	\$0.00	\$70.76
07/01/2020	\$41.56	\$8.20	\$22.10	\$0.00	\$71.86
01/01/2021	\$42.66	\$8.20	\$22.10	\$0.00	\$72.96

Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW**Effective Date - 01/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.23	\$8.20	\$0.00	\$0.00	\$28.43
2	55	\$22.25	\$8.20	\$5.94	\$0.00	\$36.39
3	60	\$24.28	\$8.20	\$6.48	\$0.00	\$38.96
4	65	\$26.30	\$8.20	\$7.02	\$0.00	\$41.52
5	70	\$28.32	\$8.20	\$18.86	\$0.00	\$55.38
6	75	\$30.35	\$8.20	\$19.40	\$0.00	\$57.95
7	80	\$32.37	\$8.20	\$19.94	\$0.00	\$60.51
8	90	\$36.41	\$8.20	\$21.02	\$0.00	\$65.63

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.78	\$8.20	\$0.00	\$0.00	\$28.98
2	55	\$22.86	\$8.20	\$5.94	\$0.00	\$37.00
3	60	\$24.94	\$8.20	\$6.48	\$0.00	\$39.62
4	65	\$27.01	\$8.20	\$7.02	\$0.00	\$42.23
5	70	\$29.09	\$8.20	\$18.86	\$0.00	\$56.15
6	75	\$31.17	\$8.20	\$19.40	\$0.00	\$58.77
7	80	\$33.25	\$8.20	\$19.94	\$0.00	\$61.39
8	90	\$37.40	\$8.20	\$21.02	\$0.00	\$66.62

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT)

PAINTERS LOCAL 35 - ZONE 2

01/01/2020	\$38.52	\$8.20	\$22.10	\$0.00	\$68.82
07/01/2020	\$39.62	\$8.20	\$22.10	\$0.00	\$69.92
01/01/2021	\$40.72	\$8.20	\$22.10	\$0.00	\$71.02

Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.26	\$8.20	\$0.00	\$0.00	\$27.46
2	55	\$21.19	\$8.20	\$5.94	\$0.00	\$35.33
3	60	\$23.11	\$8.20	\$6.48	\$0.00	\$37.79
4	65	\$25.04	\$8.20	\$7.02	\$0.00	\$40.26
5	70	\$26.96	\$8.20	\$18.86	\$0.00	\$54.02
6	75	\$28.89	\$8.20	\$19.40	\$0.00	\$56.49
7	80	\$30.82	\$8.20	\$19.94	\$0.00	\$58.96
8	90	\$34.67	\$8.20	\$21.02	\$0.00	\$63.89

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.81	\$8.20	\$0.00	\$0.00	\$28.01
2	55	\$21.79	\$8.20	\$5.94	\$0.00	\$35.93
3	60	\$23.77	\$8.20	\$6.48	\$0.00	\$38.45
4	65	\$25.75	\$8.20	\$7.02	\$0.00	\$40.97
5	70	\$27.73	\$8.20	\$18.86	\$0.00	\$54.79
6	75	\$29.72	\$8.20	\$19.40	\$0.00	\$57.32
7	80	\$31.70	\$8.20	\$19.94	\$0.00	\$59.84
8	90	\$35.66	\$8.20	\$21.02	\$0.00	\$64.88

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PANEL & PICKUP TRUCKS DRIVER	12/01/2019	\$35.18	\$12.41	\$13.72	\$0.00	\$61.31
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	06/01/2020	\$36.08	\$12.41	\$13.72	\$0.00	\$62.21
	08/01/2020	\$36.08	\$12.91	\$13.72	\$0.00	\$62.71
	12/01/2020	\$36.08	\$12.91	\$14.82	\$0.00	\$63.81
	06/01/2021	\$36.88	\$12.91	\$14.82	\$0.00	\$64.61
	08/01/2021	\$36.88	\$13.41	\$14.82	\$0.00	\$65.11
	12/01/2021	\$36.88	\$13.41	\$16.01	\$0.00	\$66.30
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99
PILE DRIVER LOCAL 56 (ZONE 1)						
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99
PILE DRIVER LOCAL 56 (ZONE 1)						

Apprentice - PILE DRIVER - Local 56 Zone 1**Effective Date - 08/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.47	\$9.90	\$21.15	\$0.00	\$55.52
2	60	\$29.36	\$9.90	\$21.15	\$0.00	\$60.41
3	70	\$34.26	\$9.90	\$21.15	\$0.00	\$65.31
4	75	\$36.71	\$9.90	\$21.15	\$0.00	\$67.76
5	80	\$39.15	\$9.90	\$21.15	\$0.00	\$70.20
6	80	\$39.15	\$9.90	\$21.15	\$0.00	\$70.20
7	90	\$44.05	\$9.90	\$21.15	\$0.00	\$75.10
8	90	\$44.05	\$9.90	\$21.15	\$0.00	\$75.10

Notes:**Apprentice to Journeyworker Ratio:1:5****PIPEFITTER & STEAMFITTER***PIPEFITTERS LOCAL 537*

03/01/2020	\$56.19	\$10.95	\$19.74	\$0.00	\$86.88
09/01/2020	\$57.69	\$10.95	\$19.74	\$0.00	\$88.38
03/01/2021	\$59.19	\$10.95	\$19.74	\$0.00	\$89.88

Apprentice - PIPEFITTER - Local 537**Effective Date - 03/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$22.48	\$10.95	\$8.00	\$0.00	\$41.43
2	45	\$25.29	\$10.95	\$19.74	\$0.00	\$55.98
3	60	\$33.71	\$10.95	\$19.74	\$0.00	\$64.40
4	70	\$39.33	\$10.95	\$19.74	\$0.00	\$70.02
5	80	\$44.95	\$10.95	\$19.74	\$0.00	\$75.64

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$23.08	\$10.95	\$8.00	\$0.00	\$42.03
2	45	\$25.96	\$10.95	\$19.74	\$0.00	\$56.65
3	60	\$34.61	\$10.95	\$19.74	\$0.00	\$65.30
4	70	\$40.38	\$10.95	\$19.74	\$0.00	\$71.07
5	80	\$46.15	\$10.95	\$19.74	\$0.00	\$76.84

Notes:

** 1:3; 3:15; 1:10 thereafter / Steps are 1 yr.

Refrig/AC Mechanic **1:1;1:2;2:4;3:6;4:8;5:10;6:12;7:14;8:17;9:20;10:23(Max)

Apprentice to Journeyworker Ratio:**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIPELAYER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						

PLUMBERS & GASFITTERS <i>PLUMBERS & GASFITTERS LOCAL 12</i>	03/01/2020	\$58.69	\$12.07	\$17.26	\$0.00	\$88.02
	09/01/2020	\$60.19	\$12.07	\$17.26	\$0.00	\$89.52
	03/01/2021	\$61.69	\$12.07	\$17.26	\$0.00	\$91.02

Apprentice - PLUMBER/GASFITTER - Local 12

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$20.54	\$12.07	\$6.24	\$0.00	\$38.85
2	40	\$23.48	\$12.07	\$7.08	\$0.00	\$42.63
3	55	\$32.28	\$12.07	\$9.63	\$0.00	\$53.98
4	65	\$38.15	\$12.07	\$11.33	\$0.00	\$61.55
5	75	\$44.02	\$12.07	\$13.03	\$0.00	\$69.12

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$21.07	\$12.07	\$6.24	\$0.00	\$39.38
2	40	\$24.08	\$12.07	\$7.08	\$0.00	\$43.23
3	55	\$33.10	\$12.07	\$9.63	\$0.00	\$54.80
4	65	\$39.12	\$12.07	\$11.33	\$0.00	\$62.52
5	75	\$45.14	\$12.07	\$13.03	\$0.00	\$70.24

Notes:

** 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr
Step4 with lic\$65.32, Step5 with lic\$72.89

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.) <i>PIPEFITTERS LOCAL 537</i>	03/01/2020	\$56.19	\$10.95	\$19.74	\$0.00	\$86.88
	09/01/2020	\$57.69	\$10.95	\$19.74	\$0.00	\$88.38
	03/01/2021	\$59.17	\$10.95	\$19.74	\$0.00	\$89.86

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10

For apprentice rates see "Apprentice- LABORER"

POWDERMAN & BLASTER <i>LABORERS - ZONE 1</i>	12/01/2019	\$40.15	\$8.10	\$16.60	\$0.00	\$64.85
	06/01/2020	\$41.14	\$8.10	\$16.60	\$0.00	\$65.84
	12/01/2020	\$42.12	\$8.10	\$16.60	\$0.00	\$66.82
	06/01/2021	\$43.14	\$8.10	\$16.60	\$0.00	\$67.84
	12/01/2021	\$44.15	\$8.10	\$16.60	\$0.00	\$68.85

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
	06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
	12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
	06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
	12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$32.47	\$12.50	\$15.70	\$0.00	\$60.67
	06/01/2020	\$33.22	\$12.50	\$15.70	\$0.00	\$61.42
	12/01/2020	\$34.00	\$12.50	\$15.70	\$0.00	\$62.20
	06/01/2021	\$34.75	\$12.50	\$15.70	\$0.00	\$62.95
	12/01/2021	\$35.54	\$12.50	\$15.70	\$0.00	\$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 42 - J.G. MacLeallan (Wakefield)</i>	05/01/2019	\$26.30	\$7.99	\$7.00	\$0.00	\$41.29
	05/01/2020	\$26.65	\$7.99	\$7.00	\$0.00	\$41.64
	05/01/2021	\$27.00	\$7.99	\$7.00	\$0.00	\$41.99
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roof Waterproofng &Roof Damproofg) <i>ROOFERS LOCAL 33</i>	03/01/2020	\$45.67	\$11.50	\$15.90	\$0.00	\$73.07
	08/01/2020	\$47.10	\$11.50	\$15.90	\$0.00	\$74.50
	02/01/2021	\$48.53	\$11.50	\$15.90	\$0.00	\$75.93
	08/01/2021	\$49.96	\$11.50	\$15.90	\$0.00	\$77.36
	02/01/2022	\$51.39	\$11.50	\$15.90	\$0.00	\$78.79

Classification

Effective Date Base Wage Health Pension Supplemental
Unemployment Total Rate

Apprentice - ROOFER - Local 33
Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.84	\$11.50	\$3.69	\$0.00	\$38.03
2	60	\$27.40	\$11.50	\$15.90	\$0.00	\$54.80
3	65	\$29.69	\$11.50	\$15.90	\$0.00	\$57.09
4	75	\$34.25	\$11.50	\$15.90	\$0.00	\$61.65
5	85	\$38.82	\$11.50	\$15.90	\$0.00	\$66.22

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.55	\$11.50	\$3.69	\$0.00	\$38.74
2	60	\$28.26	\$11.50	\$15.90	\$0.00	\$55.66
3	65	\$30.62	\$11.50	\$15.90	\$0.00	\$58.02
4	75	\$35.33	\$11.50	\$15.90	\$0.00	\$62.73
5	85	\$40.04	\$11.50	\$15.90	\$0.00	\$67.44

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1
Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.
(Hot Pitch Mechanics' receive \$1.00 hr. above ROOFER)

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE	03/01/2020	\$45.92	\$11.50	\$15.90	\$0.00	\$73.32
ROOFERS LOCAL 33	08/01/2020	\$47.35	\$11.50	\$15.90	\$0.00	\$74.75
	02/01/2021	\$48.78	\$11.50	\$15.90	\$0.00	\$76.18
	08/01/2021	\$50.21	\$11.50	\$15.90	\$0.00	\$77.61
	02/01/2022	\$51.64	\$11.50	\$15.90	\$0.00	\$79.04
For apprentice rates see "Apprentice- ROOFER"						
SHEETMETAL WORKER	02/01/2020	\$49.36	\$13.35	\$24.12	\$2.61	\$89.44
SHEETMETAL WORKERS LOCAL 17 - A	08/01/2020	\$50.96	\$13.35	\$24.12	\$2.66	\$91.09
	02/01/2021	\$52.61	\$13.35	\$24.12	\$2.71	\$92.79
	08/01/2021	\$54.36	\$13.35	\$24.12	\$2.76	\$94.59
	02/01/2022	\$56.11	\$13.35	\$24.12	\$2.81	\$96.39

Apprentice - SHEET METAL WORKER - Local 17-A**Effective Date - 02/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$20.73	\$13.35	\$5.89	\$0.00	\$39.97
2	42	\$20.73	\$13.35	\$5.89	\$0.00	\$39.97
3	47	\$23.20	\$13.35	\$11.13	\$1.43	\$49.11
4	47	\$23.20	\$13.35	\$11.13	\$1.43	\$49.11
5	52	\$25.67	\$13.35	\$12.08	\$1.53	\$52.63
6	52	\$25.67	\$13.35	\$12.33	\$1.54	\$52.89
7	60	\$29.62	\$13.35	\$13.70	\$1.70	\$58.37
8	65	\$32.08	\$13.35	\$15.15	\$1.80	\$62.38
9	75	\$37.02	\$13.35	\$16.56	\$2.01	\$68.94
10	85	\$41.96	\$13.35	\$17.96	\$2.20	\$75.47

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$21.40	\$13.35	\$5.89	\$0.00	\$40.64
2	42	\$21.40	\$13.35	\$5.89	\$0.00	\$40.64
3	47	\$23.95	\$13.35	\$11.13	\$1.45	\$49.88
4	47	\$23.95	\$13.35	\$11.13	\$1.45	\$49.88
5	52	\$26.50	\$13.35	\$12.08	\$1.56	\$53.49
6	52	\$26.50	\$13.35	\$12.33	\$1.57	\$53.75
7	60	\$30.58	\$13.35	\$13.70	\$1.73	\$59.36
8	65	\$33.12	\$13.35	\$15.15	\$1.85	\$63.47
9	75	\$38.22	\$13.35	\$16.56	\$2.04	\$70.17
10	85	\$43.32	\$13.35	\$17.96	\$2.24	\$76.87

Notes:

Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SPECIALIZED EARTH MOVING EQUIP < 35 TONS	12/01/2019	\$35.64	\$12.41	\$13.72	\$0.00	\$61.77
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	06/01/2020	\$36.54	\$12.41	\$13.72	\$0.00	\$62.67
	08/01/2020	\$36.54	\$12.91	\$13.72	\$0.00	\$63.17
	12/01/2020	\$36.54	\$12.91	\$14.82	\$0.00	\$64.27
	06/01/2021	\$37.34	\$12.91	\$14.82	\$0.00	\$65.07
	08/01/2021	\$37.34	\$13.41	\$14.82	\$0.00	\$65.57
	12/01/2021	\$37.34	\$13.41	\$16.01	\$0.00	\$66.76

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2019	\$35.93	\$12.41	\$13.72	\$0.00	\$62.06
	06/01/2020	\$36.83	\$12.41	\$13.72	\$0.00	\$62.96
	08/01/2020	\$36.83	\$12.91	\$13.72	\$0.00	\$63.46
	12/01/2020	\$36.83	\$12.91	\$14.82	\$0.00	\$64.56
	06/01/2021	\$37.63	\$12.91	\$14.82	\$0.00	\$65.36
	08/01/2021	\$37.63	\$13.41	\$14.82	\$0.00	\$65.86
	12/01/2021	\$37.63	\$13.41	\$16.01	\$0.00	\$67.05
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1</i>	03/01/2020	\$60.82	\$9.68	\$20.55	\$0.00	\$91.05
	10/01/2020	\$62.32	\$9.68	\$20.55	\$0.00	\$92.55
	03/01/2021	\$63.82	\$9.68	\$20.55	\$0.00	\$94.05

Apprentice - SPRINKLER FITTER - Local 550 (Section A) Zone 1

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$21.29	\$9.68	\$11.61	\$0.00	\$42.58
2	40	\$24.33	\$9.68	\$12.30	\$0.00	\$46.31
3	45	\$27.37	\$9.68	\$12.99	\$0.00	\$50.04
4	50	\$30.41	\$9.68	\$13.73	\$0.00	\$53.82
5	55	\$33.45	\$9.68	\$14.36	\$0.00	\$57.49
6	60	\$36.49	\$9.68	\$15.05	\$0.00	\$61.22
7	65	\$39.53	\$9.68	\$15.74	\$0.00	\$64.95
8	70	\$42.57	\$9.68	\$16.43	\$0.00	\$68.68
9	75	\$45.62	\$9.68	\$17.11	\$0.00	\$72.41
10	80	\$48.66	\$9.68	\$17.80	\$0.00	\$76.14

Effective Date - 10/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$21.81	\$9.68	\$11.61	\$0.00	\$43.10
2	40	\$24.93	\$9.68	\$12.30	\$0.00	\$46.91
3	45	\$28.04	\$9.68	\$12.99	\$0.00	\$50.71
4	50	\$31.16	\$9.68	\$13.73	\$0.00	\$54.57
5	55	\$34.28	\$9.68	\$14.36	\$0.00	\$58.32
6	60	\$37.39	\$9.68	\$15.05	\$0.00	\$62.12
7	65	\$40.51	\$9.68	\$15.74	\$0.00	\$65.93
8	70	\$43.62	\$9.68	\$16.43	\$0.00	\$69.73
9	75	\$46.74	\$9.68	\$17.11	\$0.00	\$73.53
10	80	\$49.86	\$9.68	\$17.80	\$0.00	\$77.34

Notes: Apprentice entered prior 9/30/10:
40/45/50/55/60/65/70/75/80/85
Steps are 850 hours

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
STEAM BOILER OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 103</i>	03/01/2020	\$40.13	\$13.00	\$17.12	\$0.00	\$70.25
	09/01/2020	\$41.20	\$13.00	\$17.16	\$0.00	\$71.36
	03/01/2021	\$42.66	\$13.00	\$17.27	\$0.00	\$72.93
	09/01/2021	\$44.32	\$13.00	\$17.38	\$0.00	\$74.70
	03/01/2022	\$45.83	\$13.00	\$17.49	\$0.00	\$76.32
	09/01/2022	\$47.55	\$13.00	\$17.62	\$0.00	\$78.17
	03/01/2023	\$49.11	\$13.00	\$17.73	\$0.00	\$79.84

Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103**Effective Date - 03/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$18.06	\$13.00	\$0.54	\$0.00	\$31.60
2	45	\$18.06	\$13.00	\$0.54	\$0.00	\$31.60
3	50	\$20.07	\$13.00	\$14.00	\$0.00	\$47.07
4	50	\$20.07	\$13.00	\$14.00	\$0.00	\$47.07
5	55	\$22.07	\$13.00	\$14.31	\$0.00	\$49.38
6	60	\$24.08	\$13.00	\$14.62	\$0.00	\$51.70
7	65	\$26.08	\$13.00	\$14.94	\$0.00	\$54.02
8	70	\$28.09	\$13.00	\$15.26	\$0.00	\$56.35
9	75	\$30.10	\$13.00	\$15.56	\$0.00	\$58.66
10	80	\$32.10	\$13.00	\$15.87	\$0.00	\$60.97

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$18.54	\$13.00	\$0.57	\$0.00	\$32.11
2	45	\$18.54	\$13.00	\$0.57	\$0.00	\$32.11
3	50	\$20.60	\$13.00	\$14.02	\$0.00	\$47.62
4	50	\$20.60	\$13.00	\$14.02	\$0.00	\$47.62
5	55	\$22.66	\$13.00	\$14.33	\$0.00	\$49.99
6	60	\$24.72	\$13.00	\$14.64	\$0.00	\$52.36
7	65	\$26.78	\$13.00	\$14.96	\$0.00	\$54.74
8	70	\$28.84	\$13.00	\$15.28	\$0.00	\$57.12
9	75	\$30.90	\$13.00	\$15.59	\$0.00	\$59.49
10	80	\$32.96	\$13.00	\$15.90	\$0.00	\$61.86

Notes:**Apprentice to Journeyworker Ratio:1:1**

TERRAZZO FINISHERS

BRICKLAYERS LOCAL 3 - MARBLE & TILE

02/01/2020	\$53.34	\$10.75	\$21.94	\$0.00	\$86.03
08/01/2020	\$54.69	\$10.75	\$22.09	\$0.00	\$87.53
02/01/2021	\$55.33	\$10.75	\$22.09	\$0.00	\$88.17
08/01/2021	\$56.73	\$10.75	\$22.25	\$0.00	\$89.73
02/01/2022	\$57.32	\$10.75	\$22.25	\$0.00	\$90.32

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
----------------	----------------	-----------	--------	---------	---------------------------	------------

Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.67	\$10.75	\$21.94	\$0.00	\$59.36
2	60	\$32.00	\$10.75	\$21.94	\$0.00	\$64.69
3	70	\$37.34	\$10.75	\$21.94	\$0.00	\$70.03
4	80	\$42.67	\$10.75	\$21.94	\$0.00	\$75.36
5	90	\$48.01	\$10.75	\$21.94	\$0.00	\$80.70

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.35	\$10.75	\$22.09	\$0.00	\$60.19
2	60	\$32.81	\$10.75	\$22.09	\$0.00	\$65.65
3	70	\$38.28	\$10.75	\$22.09	\$0.00	\$71.12
4	80	\$43.75	\$10.75	\$22.09	\$0.00	\$76.59
5	90	\$49.22	\$10.75	\$22.09	\$0.00	\$82.06

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2019	\$40.50	\$8.10	\$16.80	\$0.00	\$65.40
	06/01/2020	\$41.49	\$8.10	\$16.80	\$0.00	\$66.39
	12/01/2020	\$42.47	\$8.10	\$16.80	\$0.00	\$67.37
	06/01/2021	\$43.49	\$8.10	\$16.80	\$0.00	\$68.39
	12/01/2021	\$44.50	\$8.10	\$16.80	\$0.00	\$69.40
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2019	\$39.22	\$8.10	\$16.80	\$0.00	\$64.12
	06/01/2020	\$40.21	\$8.10	\$16.80	\$0.00	\$65.11
	12/01/2020	\$41.19	\$8.10	\$16.80	\$0.00	\$66.09
	06/01/2021	\$42.21	\$8.10	\$16.80	\$0.00	\$67.11
	12/01/2021	\$43.22	\$8.10	\$16.80	\$0.00	\$68.12
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2019	\$39.10	\$8.10	\$16.80	\$0.00	\$64.00
	06/01/2020	\$40.09	\$8.10	\$16.80	\$0.00	\$64.99
	12/01/2020	\$41.07	\$8.10	\$16.80	\$0.00	\$65.97
	06/01/2021	\$42.09	\$8.10	\$16.80	\$0.00	\$66.99
	12/01/2021	\$43.10	\$8.10	\$16.80	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2019	\$36.22	\$12.41	\$13.72	\$0.00	\$62.35
	06/01/2020	\$37.12	\$12.41	\$13.72	\$0.00	\$63.25
	08/01/2020	\$37.12	\$12.91	\$13.72	\$0.00	\$63.75
	12/01/2020	\$37.12	\$12.91	\$14.82	\$0.00	\$64.85
	06/01/2021	\$37.92	\$12.91	\$14.82	\$0.00	\$65.65
	08/01/2021	\$37.92	\$13.41	\$14.82	\$0.00	\$66.15
	12/01/2021	\$37.92	\$13.41	\$16.01	\$0.00	\$67.34
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2019	\$51.38	\$8.10	\$17.20	\$0.00	\$76.68
	06/01/2020	\$52.37	\$8.10	\$17.20	\$0.00	\$77.67
	12/01/2020	\$53.35	\$8.10	\$17.20	\$0.00	\$78.65
	06/01/2021	\$54.37	\$8.10	\$17.20	\$0.00	\$79.67
	12/01/2021	\$55.38	\$8.10	\$17.20	\$0.00	\$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2019	\$53.38	\$8.10	\$17.20	\$0.00	\$78.68
	06/01/2020	\$54.37	\$8.10	\$17.20	\$0.00	\$79.67
	12/01/2020	\$55.35	\$8.10	\$17.20	\$0.00	\$80.65
	06/01/2021	\$56.37	\$8.10	\$17.20	\$0.00	\$81.67
	12/01/2021	\$57.38	\$8.10	\$17.20	\$0.00	\$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2019	\$43.45	\$8.10	\$17.20	\$0.00	\$68.75
	06/01/2020	\$44.44	\$8.10	\$17.20	\$0.00	\$69.74
	12/01/2020	\$45.42	\$8.10	\$17.20	\$0.00	\$70.72
	06/01/2021	\$46.44	\$8.10	\$17.20	\$0.00	\$71.74
	12/01/2021	\$47.45	\$8.10	\$17.20	\$0.00	\$72.75
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2019	\$45.45	\$8.10	\$17.20	\$0.00	\$70.75
	06/01/2020	\$46.44	\$8.10	\$17.20	\$0.00	\$71.74
	12/01/2020	\$47.42	\$8.10	\$17.20	\$0.00	\$72.72
	06/01/2021	\$48.44	\$8.10	\$17.20	\$0.00	\$73.74
	12/01/2021	\$49.45	\$8.10	\$17.20	\$0.00	\$74.75
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2019	\$35.64	\$12.41	\$13.72	\$0.00	\$61.77
	06/01/2020	\$36.54	\$12.41	\$13.72	\$0.00	\$62.67
	08/01/2020	\$36.54	\$12.91	\$13.72	\$0.00	\$63.17
	12/01/2020	\$36.54	\$12.91	\$14.82	\$0.00	\$64.27
	06/01/2021	\$37.34	\$12.91	\$14.82	\$0.00	\$65.07
	08/01/2021	\$37.34	\$13.41	\$14.82	\$0.00	\$65.57
	12/01/2021	\$37.34	\$13.41	\$16.01	\$0.00	\$66.76
WAGON DRILL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
	06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
	12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS & GASFITTERS LOCAL 12</i>	03/01/2020	\$58.69	\$12.07	\$17.26	\$0.00	\$88.02
	09/01/2020	\$60.19	\$12.07	\$17.26	\$0.00	\$89.52
	03/01/2021	\$61.69	\$12.07	\$17.26	\$0.00	\$91.02
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$28.83	\$8.75	\$1.86	\$0.00	\$39.44
	08/30/2020	\$29.67	\$9.25	\$1.89	\$0.00	\$40.81
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$40.84	\$8.75	\$10.02	\$0.00	\$59.61
	08/30/2020	\$42.03	\$9.25	\$10.27	\$0.00	\$61.55
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$33.64	\$8.75	\$9.86	\$0.00	\$52.25
	08/30/2020	\$34.62	\$9.25	\$10.07	\$0.00	\$53.94
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$26.43	\$8.75	\$1.79	\$0.00	\$36.97
	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class A CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$40.84	\$8.75	\$14.10	\$0.00	\$63.69
	08/30/2020	\$42.03	\$9.25	\$14.35	\$0.00	\$65.63
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class B CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$36.04	\$8.75	\$10.65	\$0.00	\$55.44
	08/30/2020	\$37.09	\$9.25	\$10.87	\$0.00	\$57.21
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$21.62	\$8.75	\$1.65	\$0.00	\$32.02
	08/30/2020	\$22.25	\$9.25	\$1.67	\$0.00	\$33.17
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN -Inexperienced (<2000 Hrs.) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$26.43	\$8.75	\$1.79	\$0.00	\$36.97
	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
For apprentice rates see "Apprentice- LINEMAN"						
JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$48.05	\$8.75	\$17.19	\$0.00	\$73.99
	08/30/2020	\$49.45	\$9.25	\$17.48	\$0.00	\$76.18

Apprentice - LINEMAN (Outside Electrical) - East Local 104

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$28.83	\$8.75	\$3.36	\$0.00	\$40.94
2	65	\$31.23	\$8.75	\$3.44	\$0.00	\$43.42
3	70	\$33.64	\$8.75	\$3.51	\$0.00	\$45.90
4	75	\$36.04	\$8.75	\$5.08	\$0.00	\$49.87
5	80	\$38.44	\$8.75	\$5.15	\$0.00	\$52.34
6	85	\$40.84	\$8.75	\$5.23	\$0.00	\$54.82
7	90	\$43.25	\$8.75	\$7.30	\$0.00	\$59.30

Effective Date - 08/30/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$29.67	\$9.25	\$3.39	\$0.00	\$42.31
2	65	\$32.14	\$9.25	\$3.46	\$0.00	\$44.85
3	70	\$34.62	\$9.25	\$3.54	\$0.00	\$47.41
4	75	\$37.09	\$9.25	\$5.11	\$0.00	\$51.45
5	80	\$39.56	\$9.25	\$5.19	\$0.00	\$54.00
6	85	\$42.03	\$9.25	\$5.26	\$0.00	\$56.54
7	90	\$44.51	\$9.25	\$7.34	\$0.00	\$61.10

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	02/04/2019	\$30.73	\$4.70	\$3.17	\$0.00	\$38.60
TELEDATA LINEMAN/EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77
TREE TRIMMER <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	01/31/2016	\$18.51	\$3.55	\$0.00	\$0.00	\$22.06
This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is not on the ground. This classification does not apply to wholesale tree removal.						
TREE TRIMMER GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	01/31/2016	\$16.32	\$3.55	\$0.00	\$0.00	\$19.87

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
----------------	----------------	-----------	--------	---------	------------------------------	------------

Additional Apprentice Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentice ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)

Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

- ** Multiple ratios are listed in the comment field.
- *** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.
- **** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

TECHNICAL SPECIFICATION

SECTION 311000

SITE PREPARATION

PART 1 - GENERAL

1.01 REFERENCES

- A. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this trade.

1.02 SCOPE OF WORK

- A. Work Included: The work of this section consists of all Site Preparation work and related items as indicated on the Drawings and/or as specified herein, and includes, but is not limited to the following;
 - 1. Removing trees and other vegetation within the limit of grading, unless specifically designated to remain.
 - 2. Stripping and stockpiling topsoil.
 - 3. Removal of portions of existing site improvements designated on the Drawings for removal and any portion of existing site improvements necessary to accomplish the construction of the proposed site improvements.
 - 4. Protection of existing site elements to remain.
 - 5. Stake the layout of all essential features including but not limited to curbs, grading, pavements, drainage structures, light fixtures and planting, by a registered Engineer or Land Surveyor.
 - 6. Stake the location of all utilities within the Limit of work.
 - 7. Removal of pavements and curbs
 - 8. Removal and stockpiling of granite curb to be reset
 - 9. Abandonment of manholes and catch basins
 - 10. Adjustment to finish grade of manholes, catch basins, valves, and grates,
 - 11. Removal and stockpiling of existing, sign poles, etc. to be reset.

B. Related Work Specified In Other Sections:

- B. SECTION 31200 - EARTHWORK:
- C. SECTION 312500 EROSION AND SEDIMENTATION CONTROL
- D. SECTION 321200 – CURBS
- E. SECTION 321216 ASPHALT PAVING
- F. SECTION 321313 CONCRETE PAVING

1.03 REGULATORY REQUIREMENTS

- A. Demolition work shall conform to all applicable governing codes and regulations.
 - 1. Coordinate demolition work with utility companies. Call the DIG SAFE number (1-888-344-7233) seventy-two hours before beginning any excavation in order that all pertinent utility companies become informed of such work. This is required by Massachusetts law.
 - 2. Conform to the requirements of the municipality and other authorities having jurisdiction over the existing utilities, and notify the appropriate municipal officials in advance of performing any work.

1.04 PROJECT CONDITIONS

- A. Examination of Conditions: The Contractor will be held to have examined the premises before submitting proposals for the work and to be fully aware of the existing conditions under which the work will be done or that will in any way affects the work under this contract, and the amount of existing materials, items, and debris to be removed. No allowances will be made in this connection for error or negligence on the part of this Contractor.
- B. Perform site preparation work before commencing site construction.
- C. Locate, protect, and maintain active utilities and site improvements to remain.
- G. Restore original grades and conditions in areas adjacent to site disturbed or damaged as a result of site preparation work.

1.05 PERMITS

- A. The contractor shall make arrangements and negotiations necessary for the satisfactory legal disposal of all debris and litter at an off site location at no increase cost to the Town.

1.06 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with applicable provisions and recommendations of the following:

1. Standard Specification: Commonwealth of Massachusetts Department of Transportation, Standard Specifications for Highways and Bridges, Latest edition.
2. AASHTO: American Associating of State Highway and Transportation Officials, latest edition.
3. ASTM: American Society of Testing Materials, latest edition
4. ADA: Americans with Disabilities Act, latest edition
5. ABB: Architectural Access Board, Commonwealth of Massachusetts Regulations, latest edition.

PART 2 - PRODUCTS

2.01 WATER

- A. Water for dust control shall be free from contaminants hazardous to human health and plant growth. No calcium chloride may be used.
- B. Water for dust control shall be supplied by the Contractor.

PART 3 - EXECUTION

1.05 TIMING, TOWN'S REQUIREMENTS

- A. Before beginning Site Preparation Work the contractor shall meet jointly with the Town and Engineer in order to discuss the procedures to be utilized. Contractor shall be held responsible for any damage to all vegetation designated to remain. Engineer will be sole judge as to damage inflicted.
- B. The contractor shall give the Town adequate notice of his readiness to start Site Preparation work in order that the Town can review the Contractor's plans for parking and access to the construction site.
- C. The Contractor shall be responsible for coordinating their efforts with the operations of the existing abutters.
- D. The Contractor is responsible for acquiring all permits required to complete the work of this contract at no increased cost to the Town.

1.06 MANNER OF CONDUCTING THE WORK

- A. The work shall be conducted with prime consideration given to the following:
 1. Compliance with governing laws and building codes.

2. Safety protection and convenience of the public and workmen.
3. Protection of the existing building structure, materials and finishes to remain from damage.
4. Minimization of dirt and dust proliferation.
5. Neat and accurate cutting and trimming of elements to be partially removed, subject to the Engineers approval.

3.03 PROTECTION OF EXISTING CONDITIONS

- A. Erect, as required and/or directed, temporary walks, and barricades to maintain such access. Also, erect such structures when directed, to ensure pedestrian safety during construction operations. Remove such temporary items promptly when no longer required in specific areas.
- B. Erect and maintain temporary lights, barricades, warning signs, and guards necessary to protect streets, sidewalks and adjoining property from damage, all in accordance with applicable rules and regulations.
- C. Wet down the areas being demolished as required to prevent dust and dirt from rising.
- D. Protect all areas and structures to remain undeveloped whether inside or outside the Contract limit lines. Should these areas be damaged, this Contractor shall restore them to the satisfaction of the Designer. This includes repairing and replacing all damaged elements, structures and materials. Materials required for repair, replacement and patching shall be provided by the appropriate Subcontractor.
- E. Protect and do not disturb existing brick paving as indicated on the drawings.

3.04 PROTECTION OF EXISTING TREES TO REMAIN

- A. Protect existing trees to remain against injury or damage, including cutting, breaking, or skinning of roots, trunks or branches; smothering by stockpiled construction materials, excavated materials or vehicular traffic within the branch spread.

3.05 STRIPPING TOPSOIL

- A. Strip topsoil to its full depth at building areas, and all areas to be regraded, resurfaced or paved.
- B. Stockpile topsoil in a location acceptable to the Designer, for use in finish grading and preparation of lawns and planting beds.
 1. Stockpiled topsoil shall be free from trash, brush, stones over 3" diameter, and other extraneous material.

2. Grade and slope stockpiles for proper drainage and to prevent erosion.
 3. Topsoil not suitable for use as planting soil or in excess of that needed, shall be removed from the site.
- C. Protect all areas which are not to be resurfaced or regraded, and adjacent areas outside of the contract from damage due to site preparation work.

3.06 REMOVAL OF SITE IMPROVEMENTS

- A.. Demolition shall include the removal and disposal of stock piling of all existing site items obstructing the execution of the required work as shown on the Drawings. The Contractor shall include in his bid the cost of removal and disposal of all such items. Removal shall include both above and below grade components of each item.

3.07 REMOVAL OF EXISTING PAVEMENTS AND CURBS

- A. Remove existing sidewalks, curbs and paving as required to accommodate new construction. Remove concrete base courses completely. After pavements have been removed and the Engineer shall inspect the existing gravel base material. If deemed satisfactory by the Engineer for sub base the Contract or shall supplement it with new material or remove gravel base courses and subbases to the extent necessary to accommodate new grading and new pavement cross-sections.
- B. Included in this item will be saw cutting of pavement in areas where existing pavement is to remain. All sawed edges shall be protected from damage until new material is in place. Existing pavement, which is damaged, disturbed or settled, shall be cut back by the same method and replaced as directed by the Engineer at no additional cost to the Town.
- C. All existing granite curb deemed usable by the Engineer shall be removed and reset. Curbing shall be removed by saw cutting the existing adjacent pavements and removing the curbing so as to not damage it. Any useable existing granite curbing damaged shall be replaced with new curbing by the contractor at no additional cost to the Town.
- B. Paving and edging to be removed that intersect with paving and edging to remain (including sidewalk and street paving), and portions of pavements which must be removed for utility installation shall be saw cut in neat straight lines with power saws. Sawing shall extend through paved topping and underlying concrete.
1. Where removal of roadway pavement is necessary to install new site curbs, sawcut asphalt and remove all existing material within the limits of the patch (including bituminous concrete pavement and concrete, reinforced concrete or macadam bases) to a depth of 24 inches below and parallel to the existing pavement surface.

3.08 UTILITY STRUCTURES

- A. Coordinate all work on existing utilities with the Electrical Subcontractor, as applicable, and the authority having jurisdiction over same.
 - 1. Information on the drawings relating to existing utilities lines and services is from the best sources presently available. All such information is furnished only for information and is not guaranteed. Excavate test pits as required to determine exact locations of existing utilities.
- B. Protect active utilities from damage and remove or relocate only as directed or specified. If, in the progress of excavation, any utility should become damaged and result in any damage to public or private property, the General Contractor shall repair and restore to the original condition anything which has been damaged or disturbed, at no additional cost to the Town
 - 1. Should any utility be encountered in the excavation work, which is not indicated on the Drawings, notify the Engineer and the Town in writing and request disposition for same, before proceeding to perform the work.
- C. Abandoned Pipes or Conduits.
 - 1. Remove, plug and cap inactive utilities and utilities which have been disconnected. Plug previously abandoned drain pipes encountered with masonry brick at least 8 (eight) inches in thickness.
 - 2. Electrical conduits encountered and previously abandoned shall be removed to the limits of excavation and then be capped or plugged.
- D. Abandoned Structures
 - 1. All inlets and outlets shall be plugged with at least 8 (eight) inches of brick and mortar masonry.
 - 2. Except as noted, portions of masonry structures shall be removed to a depth of four (4) feet minimum below proposed finished grade, or as deep as required to facilitate new work.
 - 3. The structure shall be filled with sand or gravel backfill material placed in six (6) inch layers and thoroughly compacted at each level.

3.09 REMOVAL OF MISCELLANEOUS SITE ITEMS

- A. Remove, temporarily relocate during construction, and reinstall in final location any items necessary to complete the proposed site improvements. Coordinate work with applicable

authorities. Comply with all requirements concerning temporary installation and permanent reinstallation.

3.10 DISPOSAL OF WASTE MATERIAL

- A. Stockpile, haul from site, and legally dispose of waste materials and debris. Accumulation is not permitted.
- B. On-site burning of combustible materials is not permitted.

3.11 CLEANING

- A. Upon completion of site preparation work, clean areas within contract limits, remove tools and equipment. Provide site clear, clean, and free of materials and debris and suitable for site work operations.

END OF SECTION

SECTION 312000

EARTH MOVING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
1. Preparing subgrades for landscaping.
 2. Removal of underground utilities as applicable.
 3. Subbase course for concrete pavements.
 4. Subbase and base course for asphalt paving.
 5. Subsurface drainage backfill
 6. Coordination with maintenance of safe path of travel for the public.
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
1. Section 311000 - SITE CLEARING for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements.
 2. Section 312500 - EROSION AND SEDIMENTATION CONTROLS for temporary erosion and sedimentation control measures.

1.3 MATERIALS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
1. Initial Backfill: Backfill placed beside and 12-inches over pipe in a trench including haunches to support sides of pipe.
 2. Final Backfill: Backfill placed over initial backfill to fill a trench to approximately the gravel subbase layer.
- B. Base Course: Course placed between the subbase course and hot-mix asphalt paving.
- C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

- E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
 2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.
- F. Fill: Soil materials used to raise existing grades.
- G. Fill (Historic Fill): In-situ material known as Fill, also known as historic fill or miscellaneous fill, is defined as a mixture of soil and other materials which have been located in the area through man-made processes primarily for the purpose of grading, backfilling or filling in low areas. Material commonly associated with historic fill includes, but are not limited to glass, brick, ash, wood fragments and other similar granular materials. Historic fill shall not include boulders, ledge, consolidated rock, asphalt, concrete, railroad timbers, rail, cobblestones or any other abandoned building materials which would preclude the disposal of the urban fill as daily cover at a landfill. Material containing less than 10%, by volume, solid waste/debris, as determined by the Engineer, shall be classified as historic fill. Material that contains 10% or more solid waste/debris by volume, as determined by the Engineer, shall be classified as solid waste.
- H. Obstructions: Parts of old foundations and other structures, including but not limited to, granite blocks, mass concrete, steel, former and existing utilities, concrete foundations, railroad ties, cobblestones, flood slabs, wood piles and other obstructions which may interfere with new foundation or utility locations and require removal shall be classified as obstructions.
- I. Soil (Natural Soils): Soil, otherwise known as natural soil, is defined for the purposes of the Contract as unconsolidated sand, gravel, silt and clay, and the organic material which has become part of the unconsolidated soil matrix.
- J. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted.
- K. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- L. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

- M. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- N. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. Each type of plastic warning tape.
 - 2. Geotextile.
 - 3. Controlled low-strength material, including design mixture.
- B. Material Test Reports: From a qualified testing agency for each on-site and imported fill soil material proposed for fill and backfill for review by the Engineer at least one (1) week prior to use of the material indicating and interpreting test results for compliance of the following with requirements indicated:
 - 1. Classification according to ASTM D 2487.
 - 2. Modified Proctor laboratory compaction curve according to ASTM D 1557.
 - 3. Grain size analysis performed in accordance with ASTM D6913 or ASTM D7928 depending on the soil gradation
During Construction, submit written confirmation of fill lift thickness, in-place soil moisture content, and percentage of compaction to the Engineer before placing the next lift or constructing foundations or structures.
- C. Qualifications for Approving Source: Prior to earthwork operations, submit the qualifications of the persons or Agency approving the source of supply of materials and control testing and inspection.
- D. Earthwork Operations: Submit, prior to the excavation of earthwork activities, a plan describing the earthwork operations including the frequency and locations of tests and inspections. No work shall be performed until this plan has been approved by the Engineer.
- E. Supply and Control Inspection Results: Submit the results of all sources of supply and control inspections and tests. Submittals reviewed beyond the second rejection (or required submittal) shall be provided at no cost to the Owner and shall be reviewed by the Engineer at the Contractor's expense. No work shall be performed until the Engineer has approved the source of supply.
- F. Material Handling: At least two weeks prior to the start of any excavation activity submit, in writing, the following for review and shall not start excavation activity until the entire submittal is acceptable to the Engineer.
 - 1. Description of the method of dewatering excavated material and control of effluent water quality.
 - 2. Identification of a licensed hauler and disposal facility for possible vacuum collection, trucking and disposal of contaminated aqueous liquids.

3. Locations and methods of excavating, handling, and stockpiling (if applicable) excavated material, including drainage, as specified in this Section. Describe methods to keep materials from various sources separated during stockpiling operations (if applicable).
- G. Import Backfill Materials Certification: A certification statement and analytical results shall accompany each physical sample of earth materials to be imported onto the site, including but not limited to loam, bedding sand, gravel sub-base, common fill and structural backfill. At a minimum the certification shall state the point of origin and that the material is free of contaminants. The certification shall include representative sample analysis from each point of origin of backfill to be used on the site. The sample(s) shall be analyzed by a certified laboratory for total metals (MCP 14 metals), volatile organic compounds (EPA Method 8260), semi-volatile organic compounds (EPA Method 8270), petroleum hydrocarbons (EPA Method 8100), and Total PCBs and pesticides (EPA Method 8081 and 8082). On-site soils defined as suitable for reuse can be used as backfill without providing the certification required above.
 - H. Submit additional geotechnical and analytical test data and certifications for every 1000 cubic yards of material imported or reused on-site or anytime consistency of material changes in the opinion of the Engineer. Submit associated chemical laboratory data on the imported materials throughout the course of the Work, if requested by the Engineer, to evaluate the consistency of the source or process, at no additional cost to the Owner.
 - I. Pre-excavation Photographs and Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earthwork operations. Submit before earthwork begins. Maintain catalog of up-to-date photographs at the site.
 - J. Plan to Maintain Safe Path of Travel: Submit plans for maintaining safe paths of travel for the general public during the entire project, including requirement for police details of necessary.
- 1.5 PROJECT CONDITIONS
- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Abutters or the Owner unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated.
 1. Notify the Owner not less than two days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without the Owner's written permission.
 3. Contact utility-locator service for area where Project is located before excavating.
 - B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.
 - C. Contractor shall perform as many additional exploratory excavations as necessary to verify subsurface conditions and groundwater levels at time of construction.

1.6 QUALITY ASSURANCE

- A. The Owner reserves the right to perform inspections and testing at any time during the execution of work.
- B. When rework or replacement of soils are required to achieve compaction, the Owner may conduct confirmatory testing.

1.7 QUALITY CONTROL

- A. The Contractor shall assume full responsibility for control inspection and testing and give sufficient notice to the Engineer to permit the witnessing of the inspections or tests.
- B. The contractor shall engage a qualified, independent testing agency to perform quality control testing and inspections.
- C. The Engineer may require the Contractor to perform additional tests to determine compliance with these specifications.
- D. Source of Supply: No earthwork materials will be accepted on the jobsite without written approval from the Engineer. The Contractor shall perform sufficient tests and inspections necessary to determine the acceptability of the source of supply. A Certified Testing and Inspection Agency shall be used to perform such test and inspections. The qualifications of the person or agency performing these tests and inspections shall be forwarded to the Engineer for approval. Subsequent to this approval, test results showing the acceptability of the source of supply, shall be forwarded to the Engineer for approval.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil containing oil or hazardous materials at concentrations (per 1.5.G of this Specification) exceeding the MCP Reportable Concentrations applicable to the location of the work. Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; meeting the requirements of ASTM D 2940 for sub-bases.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; meeting the requirements of ASTM D 2940 for bases.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; meeting the requirements of ASTM D 2940 for sub-bases; except material specified as Free-Draining Engineered Fill shall not contain more than 5 percent passing a No. 200 sieve.
- G. Bedding Course: Naturally or artificially well graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; meeting the requirements of ASTM D 2940 for bases or sub-bases; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; meeting the requirements of ASTM D 448 for coarse-aggregate grading Size 57.
- I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; meeting the requirements of ASTM D 448 for coarse-aggregate grading Size 67.
- J. Sand: Natural or manufactured sand; meeting the requirements of ASTM C 33 for fine aggregate.
- K. Surface Fill Near Buildings: MassDOT M1.08.0 - Impervious Soil Borrow.
- L. Ordinary Fill: Satisfactory soil with 20 to 100 percent passing a No. 4 sieve, 5 to 50 percent passing a No. 50 sieve, and 0 to 20 percent passing a No. 400 sieve.
- M. Controlled Density Fill (CDF): Controlled density fill shall consist of a cementitious hard excavatable mixture of aggregate, Portland Cement, air entraining admixtures and water. The material shall be of the type specified in Massachusetts Highway Department 1995 Standard Specifications for Highway and Bridges, Type 2E. Controlled density fill shall be used as trench backfill material around structures (not including manholes and catch basins) between the top of the crushed stone layer and the top of the structure. Controlled density fill shall also be used to fill abandoned utilities and around the excavation support systems as directed by the Engineer.

2.2 GEOTEXTILES

- A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 - 1. Survivability: Class 2; AASHTO M 288.
 - 2. Grab Tensile Strength: 157 lbf; ASTM D 4632.
 - 3. Sewn Seam Strength: 142 lbf; ASTM D 4632.

4. Tear Strength: 56 lbf; ASTM D 4533.
 5. Puncture Strength: 56 lbf; ASTM D 4833.
 6. Apparent Opening Size: No. 40 sieve, maximum; ASTM D 4751.
 7. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.
- B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
1. Survivability: Class 2; AASHTO M 288.
 2. Grab Tensile Strength: 247 lbf; ASTM D 4632.
 3. Sewn Seam Strength: 222 lbf; ASTM D 4632.
 4. Tear Strength: 90 lbf; ASTM D 4533.
 5. Puncture Strength: 90 lbf; ASTM D 4833.
 6. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
 7. Permittivity: 0.02 per second, minimum; ASTM D 4491.
 8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.3 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
1. Red: Electric.
 2. Yellow: Gas, oil, steam, and dangerous materials.
 3. Orange: Telephone and other communications.
 4. Blue: Water systems.
 5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Section 311000 - SITE CLEARING.
- C. Protect and maintain erosion and sedimentation controls, which are specified in Section 311000 - SITE CLEARING and Section 312500 - EROSION AND SEDIMENTATION CONTROLS, during earthwork operations.

- D. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area. Dispose of contaminated water in accordance with regulations of authorities having jurisdiction.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - 2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
 - 2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:
 - a. 24 inches outside of concrete forms other than at footings.
 - b. 12 inches outside of concrete forms at footings.
 - c. 6 inches outside of minimum required dimensions of concrete cast against grade.
 - d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
 - e. 6 inches beneath bottom of concrete slabs on grade.
 - f. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.
- B. Contractor shall remove obstructions encountered within 2 feet of subgrades for structures, walks, pavements, or utilities.

- C. Follow a construction procedure that permits visual identification of firm stable ground. In the event that groundwater is encountered, the Engineer may require that the size of the open excavation be limited to that which can be handled by the Contractor's chosen method of dewatering and allow visual observation of the bottom and backfill placement in the dry.
- D. Exercise extreme caution while excavating so as not to damage or disturb other appurtenances, utilities, structures and buildings not designated for removal. To avoid adverse impacts on existing buildings on footings, excavation should not intrude the "zone of influence" beneath existing building footings. The Zone of Influence is defined as the section below the footing extending outward and downward at a slope of one horizontal to one vertical (1H:1V) from 1 foot beyond the outside edges of the existing footings. Any damage caused by the Contractor's operations shall be immediately repaired with materials and methods approved by the Engineer at no cost to the Owner.
- E. If unsuitable bearing materials are encountered at required subgrade elevations consult the Engineer for direction. The extent of over-excavation of unsuitable bearing materials and the type of material used to backfill over-excavations will be determined by the Engineer.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.6 SUBGRADE INSPECTION

- A. Notify Engineer when excavations have reached required subgrade.
- B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
 - 2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
 - 3. In areas where it is infeasible to have large construction equipment, proof rolling shall be performed using lighter compaction equipment such as a walk-behind trench roller as well as evaluation of the subgrade with a hand probe.
 - 4. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.7 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi may be used when approved by Engineer.
 - 1. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.

3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
 - 2. Stockpile soil materials in a location, acceptable to the OWNER Project Manager that will preclude having to relocate stockpiled soil materials that would otherwise delay or impact the Work.

3.9 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring and bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.10 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material.
 - 2. Under walks and pavements, use satisfactory soil material.
 - 3. Under steps and ramps, use engineered fill.
 - 4. Under footings and foundations, use engineered fill.

- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.11 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment, and not more than 6 inches in loose depth for material compacted by hand-operated tampers.
- B. Crushed stone shall be wrapped in filter fabric, placed in maximum 6-inch thick layers, loose measure, and compacted with a minimum of four passes of a vibratory plate or roller compactor. The crushed stone shall be uniformly blended.
- C. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- D. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
 - 1. Under structures, building slabs, steps, and pavements, compact each layer of backfill or fill soil material at 95 percent; and areas within 10 feet of structures, building slabs, steps, and pavements at 92 percent.
 - 2. Under walkways, compact each layer of backfill or fill soil material at 92 percent.
 - 3. Under lawn or unpaved areas, compact each layer of backfill or fill soil material percent to a firm and unyielding condition.
 - 4. For utility trenches, compact each layer of initial and final backfill soil material at 92 percent.
 - 5. For embankments, compact each layer at minimum 92 percent minimum.

3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.

2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
1. Lawn or Unpaved Areas: Plus or minus 1 inch.
 2. Walks: Plus or minus 1 inch.
 3. Pavements: Plus or minus 1/2 inch.

3.14 SUBSURFACE DRAINAGE

- A. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches.
1. Compact each filter material layer to a firm and unyielding condition.
- B. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. Overlay drainage backfill with 1 layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches.
1. Compact each filter material layer to a firm and unyielding condition.
 2. Place and compact impervious fill over drainage backfill in 6-inch-thick compacted layers to final subgrade.

3.15 SUBBASE AND BASE COURSES

- A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase and base course under pavements and walks as follows:
1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 2. Place base course material over subbase course under hot-mix asphalt pavement.
 3. Shape subbase and base course to required crown elevations and cross-slope grades.
 4. Place subbase and base course 6 inches or less in compacted thickness in a single layer.
 5. Place subbase and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
 6. Compact subbase and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

- C. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.16 FIELD QUALITY CONTROL

- A. Independent Testing Agency: Cooperate with the Independent Testing Agency engaged by the Owner for field quality control activities for the Work of this Section. Cooperate with field quality control personnel.
- B. Additional inspections and retesting of materials which fail to comply with specified material and installation requirements shall be performed at Contractor's expense.
- C. Allow testing agency to inspect subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- D. Footing Subgrade: Footing subgrades shall be proof compacted as described above.
- E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 6938, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Paved and Building Slab Areas: At each compacted fill and backfill layer, at least 1 test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than 3 tests.
 - 2. Foundation Wall Backfill: At each compacted backfill layer, at least 1 test for each 100 feet or less of wall length, but no fewer than 2 tests.
 - 3. Trench Backfill: At each compacted initial and final backfill layer, at least 1 test for each 150 feet or less of trench length, but no fewer than 2 tests.
- F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.17 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.

- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the User Agency's property in accordance with all applicable local, state and federal regulations.

END OF SECTION

SECTION 312500

EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
1. Control measures to prevent all erosion, siltation and sedimentation of wetlands, waterways, construction areas, adjacent areas and off-site areas.
 2. Control measures shall be accomplished adjacent to or in the following work areas:
 - a. Soil stockpiles and on-site storage and staging areas.
 - b. Cut and fill slopes and other stripped and graded areas.
 - c. Constructed and existing swales and ditches.
 - d. Surface water bodies, including retention and detention ponds.
 - e. At edge of wetlands areas, if applicable, as shown on Drawings.
 3. Additional means of protection shall be provided by the Contractor as required for continued or unforeseen erosion problems, at no additional cost to the OWNER.
 4. Periodic maintenance of all sediment control structures shall be provided to ensure intended purpose is accomplished. Sediment control measures shall be in working condition at the end of each day.
 5. After any significant rainfall, sediment control structures shall be inspected for integrity. Any damaged device shall be corrected immediately.
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
1. Section 311000 – SITE PREPARATION for protection of existing trees and other vegetation to remain.
 2. Section 312000 – EARTH MOVING for soil materials, excavating, backfilling, and site grading and removal of site utilities.

1.3 QUALITY ASSURANCE

1. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to a sediment and erosion control plan specific to the site, that

complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

2. Regulatory Order of Conditions ((Attach to the end of this Section, when applicable))

- B. Erosion control measures shall be established at the beginning of construction and maintained during the entire period of construction. On-site areas which are subject to severe erosion, and off-site areas which are especially vulnerable to damage from erosion and/or sedimentation, are to be identified and receive special attention.
- C. All land-disturbing activities are to be planned and conducted to minimize the size of the area to be exposed at any one time, and the length of time of exposure.
- D. Surface water runoff originating upgrade of exposed areas should be controlled to reduce erosion and sediment loss during the period of exposure.
- E. When the increase in the peak rates and velocity of storm water runoff resulting from a land-disturbing activity is sufficient to cause accelerated erosion of the receiving stream bed, provide measures to control both the velocity and rate of release so as to minimize accelerated erosion and increased sedimentation of the stream.
- F. All land-disturbing activities are to be planned and conducted so as to minimize off-site sedimentation damage.
- G. The Contractor is responsible for cleaning out and disposing of all sediment once the storage capacity of the sediment facility is reduced by one-half.
- H. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- I. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Straw Bales: Wire or nylon bound bales of straw, oriented around sides, rather than over and under.
- B. Stakes: Stakes for bales shall be one of the following materials: Wood stakes of sound hardwood 2 by 2 inches in size or steel reinforcing bars of at least No. 4 size. Lengths shall be approximately three feet.
- C. Siltation Fence: Fabricated or prefabricated unit consisting of the following filter fabric properties:
 - 1. Grab Tensile Strength 90 ASTM D1682
 - 2. Elongation at Failure (%) 50 ASTM D1682
 - 3. Mullen Burst Strength (PSI) 190 ASTM D3786

- | | | | |
|----|-------------------------------------|-------|-----------------------|
| 4. | Puncture Strength (lbs) | 70 | ASTM D751 (modified) |
| 5. | Slurry Flow Rate (gal/min/sf) | 0.5 | Virginia DOT VTM-51 |
| 6. | Equivalent Opening Size | 40-80 | US Std Sieve CW-02215 |
| 7. | Ultraviolet Radiation Stability (%) | 90 | ASTM G26 |
- D. Fencing: Steel posts shall be standard 6 foot long metal stamped drive stakes commonly used to support snow fences. Fencing shall be new four foot height wood lath snow fencing. Provide suitable steel staples or heavy nylon cord for securing filter cloth to support system.
- E. Protective Measures: As temporary coverings on ground areas subject to erosion, provide one of the following protective measures, and as directed by the Designer with concurrence of the OWNER:
1. Hay or straw temporary mulch, 100 pounds per 1,000 square feet.
 2. Wood fiber cellulose temporary mulch, 35 pounds per 1,000 square feet.
 3. Tackafier for anchoring mulch or straw shall be a non-petroleum based liquid bonding agent specifically made for anchoring hay or straw.
 4. Provide natural (jute, wood excelsior) or man-made (glass fiber) covering with suitable staples or anchors to secure to ground surface. Note that wire staples and non-biodegradable coverings shall not be used for any area that will be mown turf.
 5. Temporary vegetative cover for graded areas shall be undamaged, air dry threshed straw or hay free of undesirable weed seed.

PART 3 - EXECUTION

3.1 STRAW BALE BARRIERS

- A. Excavation shall be to the width of the bale and the length of the proposed barrier to a minimum depth of 4 inches.
- B. Bales shall be placed in a single row, lengthwise on proposed line, with ends of adjacent bales tightly abutting one another. In swales and ditches the barrier shall extend to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale.
- C. Staking shall be accomplished to securely anchor bales by driving at least two stakes or rebars through each bale to a minimum depth of 18 inches.
- D. The gaps between bales shall be filled by wedging straw in the gaps to prevent water from escaping between the bales.
- E. The excavated soil shall be backfilled against the barrier. Backfill shall conform to ground level on the downhill side and shall be built up to 4 inches on the uphill side. Loose straw shall then be scattered over the area immediately uphill from a straw barrier.
- F. Inspection shall be frequent and repair or replacement shall be made promptly as needed.

3.2 STABILIZED CONSTRUCTION ENTRANCE AND STONE BERMS

- A. Stone size: Use ASTM designation C-33, size No. 2 (1-1/2" to 2-1/2"). Use crushed stone.
- B. Length: As effective, but not less than 50 feet.
- C. Thickness: Not less than eight inches.
- D. Width: Not less than full width of all points on ingress or egress, but not less than 25 feet.
- E. Washing: When necessary, wheels shall be cleaned to remove sediment prior to entrance onto public right-of-way. When washing is required, it shall be done on an area stabilized with crushed stone which drains into an approved sediment trap or sediment basin. All sediment shall be prevented from entering any storm drain, ditch, or watercourse through the use of sand bags, gravel boards or other approved methods.
- F. Maintenance: The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-or-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spoiled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
- G. Place crushed stone berms in locations required and as directed. Berms shall have side slopes of 1:3 or less.
- H. Inspect stone berms periodically and replace and/or regrade crushed stone as required.

3.3 SILT FENCING

- A. Excavate a 6 inch trench along the upstream side of the desired fence location.
- B. Drive fence posts a minimum of 1'-6" into the ground. Install fence, well-staked at maximum eight foot intervals in locations as shown on Drawings. Secure fabric to fence and bury fabric end within the six inch deep trench cut.
- C. Lay lower 12 inches of silt fence into the trench, 6 inches deep and 6 inches wide. Backfill trench and compact. Overlap joints in fabric at post to prevent leakage of silt at seam.

3.4 EROSION CONTROL GRASSING

- A. Grassing shall be applied according to State of Massachusetts Highway Department Standard Specifications.

3.5 INLET PROTECTION

- A. Install silt fence or straw bales around inlet as specified herein.

3.6 DUST CONTROL

- A. Throughout the construction period the Contractor shall carry on an active program for the control of fugitive dust within all site construction zones, or areas disturbed as a result of construction. Control methods shall include the following: Apply calcium chloride at a uniform rate of one and one-half (1 ½) pounds per square yard in areas subject to blowing. For emergency control of dust apply water to affected areas. The source of supply and the method of application for water are the responsibility of the contractor.
- B. The frequency and methods of application for fugitive dust control shall be as directed by the Designer with concurrence by the OWNER.

3.7 TEMPORARY PROTECTIVE COVERINGS (AFTER GROWING SEASON)

- A. Place temporary covering for erosion and sedimentation control on all areas that have been graded and left exposed after October 30. Contractor shall have the choice to use either or both of the methods described herein.
- B. Hay or straw shall be anchored in-place by one of the following methods and as approved by the Designer with concurrence by the OWNER: Mechanical “crimping” with a tractor drawn device specifically devised to cut mulch into top two inches of soil surface or application of non-petroleum based liquid tackifier, applied at a rate and in accordance with manufacturer’s instructions for specific mulch material utilized.
- C. Placement of mesh or blanket matting and anchoring in place shall be in accordance with manufacturer’s printed instructions.
- D. Inspect protective coverings periodically and reset or replace materials as required.

END OF SECTION

SECTION 320523

CAST IN PLACE CONCRETE

PART 1- GENERAL

1.01 REFERENCES

- A. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this trade.

1.02 SCOPE

- A. Work under this section shall include all cast-in-place concrete work for light pole bases, including admixtures, concrete mixing, placing, finishing and curing, and installation.

1.03 RELATED WORK

- A. Concrete Paving – Section 321313
- B. Brick Paving - Section 321314

1.04 GENERAL

- A. The Contractor shall furnish to the Engineer drawings and descriptions of plant equipment or name of ready mix concrete vendor, concrete forms and methods of placement proposed to be used to accomplish the work. The details submitted shall demonstrate that the specified provisions for quality concrete and workmanship can be attained and that sufficient plant capacity will be available to ensure completion of the work.
- B. Class of Concrete: All cast-in-place concrete, unless otherwise specified, shall have a minimum 28-day compressive strength of 4000 psi.
- C. Unless otherwise designated in the following Specifications, or otherwise shown on the Contract Drawings or subsequent working drawings, the method of placement of concrete, the proper location of construction joints and other practices with respect to concrete shall conform to the most recent specifications of American Concrete Institute (ACI).
- D. Except as otherwise specified, the following publications of the American Concrete Institute are hereby incorporated in this Specification:

Building Code Requirements for Reinforced Concrete	ACI 318
Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete	ACI 304
Recommended Practice for Concrete Framework	ACI 347
Recommended Practice for Hot Weather Concreting	ACI 305R

McCall Middle School Traffic Improvement Project
Town of Winchester, Massachusetts

Recommended Practice for Cold Weather Concreting ACI 306R
Recommended Practice for Curing Concrete ACI 308

1.05 COMPOSITION AND PROPORTIONS OF CONCRETE:

Concrete shall be made of Portland cement, sand, coarse aggregates, admixtures and water, the qualities herein specified, thoroughly mixed and brought to the proper consistency before being transported to the forms. Except as otherwise required, all concrete shall contain admixtures only as directed, and approved by the Engineer. The admixtures may consist of water reducing agents, set retarding agents, air-entraining agents, heat retarding agents, or other admixtures approved by the Engineer.

- A. The design mix for concrete shall be prepared at the Contractor's expense and shall be proportioned in accordance with "Selection of concrete Proportions", ACI 318 and based on the use of materials as specified herein. The Contractor shall submit his proposed mix designs for all uses to the Engineer for its approval. No concrete shall be placed prior to obtaining mix approval from the Engineer.
- B. Water in the mixes, including surface moisture on the sand and coarse aggregates, shall be the minimum amounts that will result in concrete that can be handled by transporting, placing and consolidating equipment. The net water-cement ratio shall not exceed that given in Table A, below.
- C. Air entraining agents shall be added to all concrete to produce a total air entrained content as determined in accordance with ASTM C231 or C173 as follows:
 - 1. 5 percent plus or minus one percent for $\frac{3}{4}$ inch coarse maximum size aggregate concrete.
- D. The proportions of the mix shall be determined by weight unless otherwise permitted. The equipment for weighing materials entering the concrete mix shall be such that proportions can be accurately controlled and easily checked at any time during the batching.

TABLE A
FOR FIELD MIXES

Class	Min. Allowable Compr. Str. Psi @ 28 days	Max. Allowable Net Water Content Gallons/sack*	Cement Factor Sacks/cu. yd. Min.** Permissible	Max Aggregate Size (in)
A	4000	5.00	7.0	1 ½"
B	3000	5.50	6.5	1 ½"
C	5000	4.50	8.5	¾"

- Maximum; decrease if possible. This represents total water in mix at time of mixing, including free water on aggregates.

** Minimum; increase as necessary to meet other requirements.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Admixtures: Water reducing agent shall be ready-to-use liquid material containing no calcium chloride, and shall conform to ASTM 494, Type A. The retarder shall be a ready-to-use liquid material conforming to ASTM C494, Type B or D. Air entraining admixtures shall be used as required for all concrete to provide the air entrainment specified and shall conform to ASTM C260. Admixtures shall not discolor the concrete. All admixtures shall be used in strict accordance with the directions of the manufacturer for the purpose of meeting the requirements specified.
- B. It is the Contractor's responsibility to ensure compatibility of the different admixtures. Admixtures shall not contribute more than 0.03% water soluble chloride ion by weight of cement. The water portion of all admixtures shall be included as part of the water-cement ratio.
- C. Water shall be potable, clear and free from oil, acid, alkali, organic matter, silt, detergents or other deleterious substances. The amount of water including surface or free moisture in the aggregates shall be measured and controlled so that the water-cement ratio of each mix shall be accurately obtained.
- D. Portland Cement shall be ASTM C150. Type II with false set requirements... Use one brand and one source for all concrete.
- E. Fine aggregates used for manufacturing concrete and mortar for all parts of the work shall consist of sand, or other inert materials having similar characteristics, or a combination thereof, having acceptable gradation or particles sizes, and consisting of hard, strong, durable grains of quartz or other suitable hard rocks.
- F. Fine aggregates shall have a finess modules of 2.80 (*/-0.20), and shall not contain more than 3 percent by weight of material passing the number 100 sieve when graded in accordance with ASTM C33, and shall not contain more than 2 percent by weight of material passing the number 100 sieve when tested dry.
- G. Fine aggregates shall be moderately sharp particles, free from injurious amounts of dust, lumps, soft or flaky particles, shale, clay, decomposed grains, mica and ferruginous cemented sand. The particles shall be free from alkali and other surface coatings and shall not contain excessive amounts of organic matter, as determined by a color test made in accordance with ASTM C40. Fine aggregates

McCall Middle School Traffic Improvement Project
Town of Winchester, Massachusetts

shall be tested for soundness by five alternations of the accelerated soundness test using Magnesium Sulfate performed in accordance with ASTM C88, except that the maximum loss of weight shall not exceed 5 percent.

- H. Coarse aggregates for concrete shall consist of fragments of hard, durable, insoluble stone or crushed rock of the sizes herein specified. Aggregate shall be free from dirt, clay, dust, alkali, perishable matter or other deleterious substances, and shall be free from injurious amounts of soft, friable, thin, elongated or laminated pieces.
- I. Coarse aggregates shall be washed or screened, or both if necessary, to remove such substances. In general, no more than 1 percent by weight of the matter shall be removed by decantation, no more than 5 percent by weight shall consist of structurally weak particles; and the loss in weight as determined by five alternations of the accelerated soundness test, using Magnesium Sulfate, performed in accordance with ASTM C88, "Test for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate" except that it shall not exceed 5 percent.
 - 1. The aggregates shall be well graded from coarse to fine in each size group and the gradation shall be within the limits prescribed in ASTM C33 at the time the materials enter the batching scales.
 - 2. The maximum size of coarse aggregate shall be $\frac{3}{4}$ inch.
- H. Curing Compounds for concrete work shall conform to ASTM C309.
- I. Bonding Agent shall be an epoxy type, as manufactured by Sika Chemical Corporation, W.R. Grace & Co., Master Builders or equal, and applied in accordance with the manufacturer's recommendation.
- K. Expansion Joint Materials
 - 1. Preformed expansion joint filter.
 - a. Backer rod shall be a continuous non-gassing, soft, round cell polyurethane foam of sufficient width to be compressed 25% in maximum joint width.
- L. Joint Sealants
 - 1. The joint sealant shall be a two-component, non-sag or self-leveling, polyurethane-base material such as Sikaflex-2C or equivalent.
 - 2. Use of a backer rod is required.
 - 3. Primers as required or recommended by the manufacturer of the joint sealant.
- M. Reinforcing:

1. Reinforcing bars and materials shall be of size and materials
2. Reinforcing materials shall be placed as shown on the contract drawings placement as shown on the contract drawings.

PART 3 – EXECUTION

3.01 BATCHING AND MIXING

- A. Concrete measuring, mixing and placing shall conform to practices as specified in ACI-304, and as further required by the procedures outlined hereinafter. Concrete shall be mixed in mechanical mixers of the rotating drum type, except that if permitted, relatively small quantities may be mixed by hand.
- B. Concrete batching and mixing shall be at all times under the control of competent and experienced men. The mixing equipment shall be cleaned at frequent intervals while in use.
- C. Aggregate batches shall be uniform in grading and moisture content and shall be mixed to the specified consistency and workability. The stiffest concrete mixes that can be handled readily by modern placing and consolidation equipment in any particular placement will be required. In no case will concrete having a slump of less than two inches or exceeding six inches in the forms be permitted, except with express permission or order of the Engineer. Slump tests shall be made by the Engineer.
- D. Mixing shall be done in batches of the sizes directed. No materials shall be permitted to enter the mixing drum until all of the preceding batch is discharged. The time of mixing shall be measured from the time when all materials, including the water, are in the mixer until the first part of the batch is discharged, and shall not be for less than two minutes, or until every particle of aggregate is covered with mortar. No retempering will be allowed.
- E. No concrete which has attained its initial set shall be placed and shall be removed and disposed of off site by the Contractor.
- F. All concrete entering the forms shall be of uniform consistency, free from segregation and shall not contain lumps. If at any time segregation occurs, the Engineer may require that the materials be satisfactorily remixed at the point of deposit. If concrete ingredients are dry batched at a point distant from the work, the batches shall be kept dry during transportation to the work. Unless the cement is kept separate from the aggregates, all batched concrete so transported shall be controlled by the provisions of ACI-304, Section 5.2.3.
- G. Water reducing agents, retardants, air entraining or other approved agents used in the concrete shall be carefully measured and dispensed and the time of final mixing shall be sufficient to ensure uniform dispersal throughout the mix.
- H. Central Mixing Plant. The cement and the amounts of each separate size of aggregate entering each batch of concrete shall be determined by direct-weighting equipment which shall comply with the following requirements:

McCall Middle School Traffic Improvement Project
Town of Winchester, Massachusetts

1. Its accuracy shall conform to the requirements of the United States National Bureau of Standards Handbook 44 for such equipment. Spring scales shall not be permitted.
 2. It shall weigh each size of aggregate separately and each unit shall include an under-and-over weight indicator. The under-weight indicator shall register during the filling of the last two hundred (200) pounds of the batch. The over-weight indicator shall indicate over-weight to a maximum of fifty (50) pounds. Both indicators shall be graduated in a clear and legible manner. At the Contractors option, cumulative weighting equipment may be used instead of the individual weighing equipment herein specified. Such equipment shall be equipped with a visible dial, or equaling suitable device, which will accurately indicate scale load at any stage of the weighting operation from the zero to full load.
 3. It shall be so arranged that the operator may conveniently observe and inspect the operation of the bin gates and the materials in each weighing hopper. The under-and-over weight indicators of weighing dials and the water-measuring device shall be in full view of the operator when he is at the controls.
 4. It shall be capable of ready adjustment for compensating for the varying weight of moisture contained in the aggregate, or for changing the proportions of batch weights.
 5. It shall be operated to control the weight of the cement and that of the line and coarse aggregates to within one percent of the required weights for each. In special cases, the Engineer may approve the use of manually operated equipment.
 6. It shall be so arranged as to permit the convenient removal or over-weight material in excess of the prescribed tolerances.
 7. The station from which the control of the weighing and mixing operation is directed shall be located in such a position that the operator may conveniently observe the concrete in the mixer during the mixing operation.
- E. Batching plant for dry mixing or for preparing the aggregates for transportation shall conform to the requirements of paragraphs 5 to 7 above.
- F. The Contractor shall provide standardized metallic weights for testing the accuracy of the weighing equipment and shall test the cement scales at least once daily and the other weighing equipment at least once weekly. All such test shall be conducted in the presence of the Engineer.
- G. The quantity of water entering the mix shall be measured by a suitable tank or other measuring device of a type approved by the Engineer and capable of measuring the water in variable amounts within a tolerance of one percent. The mechanism shall be capable of being locked in a position so as to deliver any specified amount of water to each batch. A positive quick-acting valve shall be used for a cut-off in the water line to the mixer. The operating mechanism much

be such that leakage will not occur when the valves are closed. The use of horizontal tanks for the measurements of water will not be permitted.

- H. The use of transit-mix concrete will be permitted only if the Contractor arranges with the supplier for the required controls and inspection by the Engineer at the plant furnishing this concrete, and only if such concrete otherwise fulfills other requirements specified herein.
- I. The use of transit-mixed concrete will be permitted only for truck mixers of approved revolving-drum type, equipment with calibrated tanks for accurately measuring the mixing water and carrying the manufacturers seal of the rated capacity of the truck. All trucks before loading shall reverse drums to discharge all water and/or materials that may remain in the drum in full view of the Engineer prior to batching. Inspection slips shall be issued to each truck satisfactorily complying with the following requirements and no load shall be accepted at the job site without such slip.
- J. The maximum size of batch in the truck shall not exceed the manufacturers rated capacity as a mixer. The charge in the mixer shall be reduced if in the opinion of the Engineer, such reduction is required to attain the specified quality and uniformity of the concrete. Truck mixing shall begin with thirty (30) minutes after the cement has been added to the batch and mixing shall continue for a period of time sufficient to result in uniform consistency and gradation throughout the batch.
- K. Mixing in truck mixers shall begin immediately after admixtures are added and shall continue for at least thirty (30) revolutions of the mixers to ensure complete dispersion of the admixture throughout the load, followed by slow agitation during transport to the job site and final mixing at the job site. If concrete is mixed at a central plant and transported in truck mixers, the size of the batch shall not exceed the manufacturers rated capacity as an agitator.
- L. Concrete transported in a truck mixer or agitator shall be discharged at the job with one and one-half (1½) hours and completely discharged from the mixer into its final location within two (2) hours after cement has been added. In hot weather, reduce this time limit so that no stiffening of the concrete shall occur until after it has been placed. However, all concrete that has attained it's initial set or has exceeded the mixing limit before placing shall be discarded at once and removed from the site by the Contractor regardless of the length of time the concrete has been in the mixer.
- M. Trucks to conform to the latest edition of the Specification of the National Ready Mix Concrete Association.

3.01 CONCRETE APPLIANCES AND MATERIALS TO BE ON HAND

- A. The Contractor shall have tools, machinery, appliances and all materials on hand by the time they may possibly be needed, so that concrete can be placed promptly to meet the construction requirements.

3.02 PLACING CONCRETE

- A. General. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent the separation or loss of component materials. When concrete is conveyed by chuting, the plant shall be of such size and design as to ensure a continuous flow in the chute. The slope of the chute shall be such that concrete of the required consistency flows segregation. The chute shall be flushed with water before and after each run; the water used for this purpose is to be discharged outside the forms. Chutes shall be U-shaped designed for this functions and in general shall have a slope varying from 25 degrees to 45 degrees. The maximum drop shall be 5 feet and unless mechanical conveyors are employed, the maximum horizontal distance shall be 5 feet. If the pumpcrete method is employed in the delivery of concrete from the mixer to the placement location, aluminum piping shall not be used and, in addition a separate design mix will be required to be submitted for the Engineer's approval.
1. In general, the methods of placing concrete shall be such as to result in a compact, dense, homogeneous and impervious concrete, completely filling the space being concreted. Concrete adjacent to forms shall be continuously and sufficiently worked, spaded and vibrated to expel air. High speed electrical or air-operated immersion-type vibrating equipment shall be used to consolidate the concrete into a dense and watertight mass. Stones shall be carefully spaded away from the faces to be exposed. Concrete shall be spread in horizontal layers not to exceed 18 to 24 inches thick to the extent practicable as determined by the Engineer. Consolidation shall be thorough for each layer and shall extend through the layer into the previously placed fresh concrete to provide integral mass.
 2. The minimum number of vibrators shall be as follows:

1 per 10 c.y. per hour for Walls

2 per 20 c.y. per hour for Slabs and Foundations

1 spare in proper working conditions at all times.
 3. The rated capacity of the vibrators shall be 10,000 rpm minimum. The vibrators shall be inserted in the freshly placed concrete at approximately 18 to 30 inch intervals and shall operate in each insertion for a period of 5 to 15 seconds.
 6. The temperature range of concrete when placed shall be between 60 degrees F. to 90 degrees F.

3.03 UNSUITABLE CONDITIONS

- A. The construction of concrete structures will be prohibited when, in the judgement of the Engineer, the conditions are unsuitable or the proper precautions are not being taken or the work being conducted is in any way unsatisfactory to the Engineer.

3.04 CURING CONCRETE

- A. Every precaution shall be taken to prevent concrete from drying out until it has thoroughly set and hardened. To this end, sprinkling may be required within three hours after the completion of each section of placement and thereafter, it shall be kept continuously moist for fourteen days. Wooden forms shall be wetted immediately before concrete is placed and shall be kept wet until removed.
- B. Curing compounds or liquids for certain surfaces, if expressly permitted to be used by the Engineer, shall be employed strictly in accordance with the manufacturer's directions. Curing compounds shall not be used on surfaces receiving monolithic or epoxy finishes, construction joints or surfaces to be bonded with future concrete. Recommended methods for curing concrete set forth in the American Concrete Institute bulletin ACI 308 shall be followed unless otherwise directed by the Engineer

3.05 TESTING

- A. Four concrete cylinders shall be taken by the Contractor for each 50 cubic yards of concrete or portion thereof placed in one day. Samples of concrete shall be taken at the nearest point of final placement.
- B. A curing box capable of maintaining the required moisture and temperature shall be provided by the Contractor.
- C. The Contractor shall notify the Engineer or designated testing laboratory at least 48 hours in advance of every placement operation so that arrangements may be made for supervising the taking of samples.
- D. One of each set of cylinders will be tested at 7 days, and if the 7 day strength is deficient, the Authority shall be notified. One cylinder will be tested at 14 days and one at 28 days. One cylinder will be retained for 45 day testing. Forty-five day tests will not be required if 28 day tests are satisfactory. The Contractor shall be held responsible for additional tests and removal and replacement of unacceptable work.
- E. Where the ultimate 28 day compressive strength of concrete in any test cylinder falls below the strength specified for the class of concrete tested, the water/cement ratio, aggregate proportions or temperature conditions shall be changed to secure the required strength. The Contractor shall be held responsible for additional tests and removal and replacement of unacceptable work.
- F. Load Tests: In the event that laboratory tests taken from any part of the structure indicate that an apparent failure is likely to develop at the ultimate strengths required at 28 days, the Engineer may, at his discretion, order load tests or other tests to be made on the portion of the structure affected to determine the adequacy of such portion to sustain the loads for which its members are designed. These tests, if required, will be made at the Contractor's expense, and shall conform to the requirements of ACI-318, Chapter 120. If the structure, or any

McCall Middle School Traffic Improvement Project
Town of Winchester, Massachusetts

part of the structure, cannot pass the load tests, it shall be removed and replaced at the Contractors expense.

- G. The testing agency shall be selected and paid by the Authority and shall perform all inspection and testing specified herein, except that the cost of re-testing shall be borne by the Contractor as described herein.

END OF SECTION

SECTION 321200

CURBS

PART 1 – GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Removal and resetting of curbs, curb corners, pavement removal and restoration.
 - 2. Work includes the provisions of new granite curb to supplement deficiencies in quantities of reset granite curb and also to provide new radius curb where required by the contract drawings.
 - 3. Work includes the provision of reflectorized pavement marking for new parking locations and crosswalks.
- B. Related Work Specified Elsewhere:
 - 1. Section 321216 - Asphalt Paving
 - 2. Section 321313 – Concrete Paving.
 - 3. Section 321314– Brick Paving
 - 4. Section 311000 – Site Clearing

1.3 SUBMITTALS

- A. Shop Drawings: Submit the detailed layout configuration illustrating curb section lengths and radii for the entire installation including standard radius, corner, ramp and closure curb sections. The configuration shall include the limits of reset and new curb types.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the Massachusetts Department of Transportation (MassDOT) for granite curb.
 - 1. Comply with requirements of the Massachusetts DOT (MassDOT) Standard Specifications for Highways and Bridges, including supplemental specifications and special provisions.
 - 2. Comply with requirements of the Americans with Disabilities Act (ADA) and the Massachusetts Architectural Access Board (MAAB). If these requirements cannot be met with the grades and slopes indicated on the plans, notify the Designer immediately.

3. Comply with requirements of the local authority having jurisdiction concerning the location and construction of accessible curb cuts.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. New granite street curb and granite curb installed flush at crosswalks and driveways shall conform to the requirements of Type VA-4.
- B. New parking locations shall be delineated with reflectorized white traffic paint and crosswalks with reflectorized white thermoplastic.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install granite curb in accordance with the construction methods requirements as shown on Drawings, unless otherwise specified by Engineer.
- B. All curb to be removed, relocated and reset shall be reset so that curb of similar width shall be placed in contiguous sections. New curb required to supplement missing or broken granite curb shall also be place in contiguous sections.
- C. Curb alignment shall be uniform, with smooth and continuous arris lines. Radius curbs shall meet with a common tangent.
- D. Curb shall be fitted together as closely as possible. Joints between curbstones shall be carefully filled with cement mortar and neatly pointed on the top of exposed faces. After pointing, clean off all excess mortar and tool joints slightly below adjacent stone surfaces.
- E. Concrete shall be used for setting the curb as shown on the contract drawings. Curved granite curb shall be required for all radii less than 100 feet. Curb shall be thoroughly cleaned to remove all stains and mortar.
- F. Following a minimum curing period of 3 weeks, clean surfaces following manufacturer's direction, with an approved liquid masonry cleaner, which is specifically made for removing cement mortar, as specified, for the curb. Use fiber brushes to remove all mortar film and mortar stains. Test clean a sample area of curb for review by Landscape Engineer prior to proceeding with the balance of work.

END OF SECTION

SECTION 321216

ASPHALT PAVING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Hot-mix asphalt paving, including walkways, ramps and curbs.
 - 2. Hot-mix asphalt patching.
 - 3. Pavement-marking paint.
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
 - 1. Section 312000 - EARTH MOVING for aggregate subbase and base courses and for aggregate pavement shoulders.
 - 2. Section 311000 – SITE CLEARING for site preparation
 - 3. Section 312500 EROSION AND SEDIMENTATION CONTROLS
- C. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
 - 1. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
- D. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.
- E. Material Certificates: For each paving material, from manufacturer.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by the Massachusetts Department of Transportation (MassDOT).
- B. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the Massachusetts Department of Transportation (MassDOT) for hot mix asphalt paving work.

1. Comply with requirements of the Massachusetts Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges, including supplemental specifications and special provisions.
 2. Comply with requirements of the Americans with Disabilities Act (ADA) and the Massachusetts Architectural Access Board (AAB). If these requirements cannot be met with the grades and slopes indicated on the plans, notify the Designer immediately.
 3. Comply with requirements of the local authority having jurisdiction concerning the location and construction of accessible curb cuts.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.
1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:
 - a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
 - b. Review condition of subgrade and preparatory work.
 - c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
 - d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.5 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- B. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
 1. Tack Coat: Minimum surface temperature of 60 degrees F.
 2. Asphalt Base Course: Minimum surface temperature of 40 degrees F and rising at time of placement.
 3. Asphalt Surface Course: Minimum surface temperature of 60 degrees F at time of placement.

- C. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 degrees F for water-based materials, and not exceeding 95 degrees F.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. Coarse Aggregate: ASTM D692, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.
- B. Fine Aggregate: ASTM D1073 or AASHTO M29, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.
- C. Mineral Filler: ASTM D242 or AASHTO M17, rock or slag dust, hydraulic cement, or other inert material.
- D. Reclaimed Asphalt Pavement (RAP): Provide material obtained from the highways or streets by crushing, milling, or planing existing hot mix asphalt pavements.
 - 1. The proportion of RAP to virgin aggregate for base course mixtures and intermediate course mixtures shall be limited to a maximum of 40% for drum mix plants and 20% for modified batch plants. The maximum amount of RAP for surface course mixtures shall be 10%.

2.2 ASPHALT MATERIALS

- A. Asphalt Binder, Performance Graded: AASHTO M320 or AASHTO MP1a, performance grade as required by MASSDOT Specifications.
- B. Tack Coat: AASHTO M140 emulsified asphalt, or AASHTO M208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

2.3 AUXILIARY MATERIALS

- A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.
- B. Pavement-Marking Paint: Acrylic/latex type, low VOC, traffic marking paint.
 - 1. Color: As indicated.

2.4 ASPHALT MIXES

- A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by MASSDOT Specifications and designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types".

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
- C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 COLD MILLING

- A. Clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement by cold milling to grades and cross sections indicated.

3.3 PATCHING

- A. Existing Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.
- B. Existing Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.
 - 1. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.
- C. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a minimum rate of 0.05 to 0.15 gal./sq. yd..
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- D. Patching: Fill excavated pavements with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

3.4 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

- B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
- C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd..
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.5 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
 - 1. Spread mix at minimum temperature of 250 degrees F.
 - 2. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.6 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
 - 1. Clean contact surfaces and apply tack coat to joints.
 - 2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
 - 3. Offset transverse joints, in successive courses, a minimum of 24 inches.
 - 4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."

3.7 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
 - 1. Complete compaction before mix temperature cools to 185 degrees F.

- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
 - 1. Average Density: ASTM D2041, per MassDOT Specifications.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.8 INSTALLATION TOLERANCES

- A. Accessibility: Comply with requirements of Massachusetts Architectural Access Board and ADAAG requirements. Remove and replace paving that does not meet required tolerances, when measured with a 2 foot straightedge.
- B. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus 1/2 inch.
 - 2. Surface Course: Plus 1/4 inch, no minus.
- C. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within MASSDOT Specification tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas.

3.9 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Designer.
- B. Allow paving to age for a minimum of 30 days before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust.
- D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

3.10 FIELD QUALITY CONTROL

- A. Independent Testing Agency: Cooperate with the Independent Testing Agency engaged by the Owner for field quality control activities for the Work of this Section
- B. Test the plane of the finished surfaces of base, binder, and surface courses with a 16-foot straightedge, except use a 10-foot straightedge on vertical courses and on the top course of resurfaced streets which contain manhole covers, valve boxes, and the like.
- C. Carefully apply the straightedge immediately after the first compaction by rolling, and from then on as may be necessary until and after the final compaction of the material in place. Hold the straightedge in successive positions parallel to the road centerline and in contact with the road surface; check the entire area from one side of the pavement to the other.
- D. Correct irregularities which vary $\frac{3}{8}$ inch from a true finished surface in base and binder courses, and $\frac{1}{4}$ inch in top courses.
- E. Irregularities which may develop before the completion of rolling and while the material is still workable, may be remedied by loosening the surface mixture and removing or adding material as necessary. Should any unsatisfactory irregularities or defects remain after final compaction, correct the defective work by removing and replacing with new material to form a true and even surface.

3.11 OPENING TO TRAFFIC

- A. No vehicular traffic or loads shall be permitted on the newly completed pavement until adequate stability has been attained, and the material has cooled sufficiently to prevent distortion or loss of fines, and the pavement has achieved a maximum temperature of 140 degrees F.
- B. If the climatic or other conditions warrant it, the period of time before opening to traffic may be extended at the discretion of the Engineer.

3.12 DISPOSAL

- A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

END OF SECTION

SECTION 321313

CONCRETE PAVING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Cement concrete paving, including walkways, ramps and accessible curb cuts.
 - 2. Pavement-marking paint.
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
 - 1. Section 312000 - EARTH MOVING for subgrade preparation, grading, and subbase course.
 - 2. 321200 Curbs for installation of Curbing

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
- B. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Qualification Data: For manufacturer and testing agency.
- D. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:
 - 1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.
- E. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:
 - 1. Cementitious materials.

2. Steel reinforcement and reinforcement accessories.
3. Fiber reinforcement.
4. Admixtures.
5. Curing compounds.
6. Applied finish materials.
7. Joint fillers.

F. Field quality-control test reports.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C94/C94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the local authorities having jurisdiction for concrete asphalt paving work.
1. Comply with requirements of the Americans with Disabilities Act (ADA) and the Massachusetts Architectural Access Board (AAB). If these requirements cannot be met with the grades and slopes indicated on the plans, notify the Designer immediately.
 2. Comply with requirements of the local authorities having jurisdiction concerning the location and construction of accessible curb cuts.
- C. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.
- D. Mockups: Cast mockups of full-size sections of concrete pavement to demonstrate typical joints, surface finish, texture, color, and standard of workmanship.
1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Designer.
 2. Notify Designer seven days in advance of dates and times when mockups will be constructed.
 3. Obtain Designer's approval of mockups before starting construction.
 4. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.
 5. Demolish and remove approved mockups from the site when directed by Designer.
 6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.
1. Before submitting design mixtures, review concrete pavement mixture design and examine procedures for ensuring quality of concrete materials and concrete pavement

McCall Middle School Traffic Improvement Project
Town of Winchester, Massachusetts

construction practices. Require representatives, including the following, of each entity directly concerned with concrete pavement, to attend conference:

- a. Contractor's superintendent.
- b. Independent testing agency responsible for concrete design mixtures.
- c. Ready-mix concrete producer.
- d. Concrete pavement subcontractor.
- e. Project Engineer.

1.5 ADA AND AAB COMPLIANCE

- A. Comply with American with Disabilities Act (ADA) and the requirements of the Massachusetts Architectural Access Board (AAB).
 1. Slopes: Walkways as defined by Section 22.1 of 521 CMR shall be graded to a maximum of 4.5%. The cross-pitch (perpendicular to travel) for walkways and paths shall be constructed at 1.5%. The slopes of ramps and side slopes on handicap curb cuts as defined by Section 21.1 of 521 CMR shall be constructed at 7% maximum. Ramps as defined in Section 24.1 of 521 CMR shall be constructed to a maximum slope of 7%.
 2. The Contractor is to assume that sidewalk grades will be verified and checked with a 2-foot long electronic 'smart level'.
 3. A 5'-0" minimum level, 1.5% pitch, area shall be provided at entrances to buildings. Puddling or ponding of water at the entrances will not be accepted.
 4. The requirements specified hereinabove shall supercede the grades indicated on the Drawings. If these requirements cannot be met with the grades indicated on the Drawings, the Designer shall be notified immediately for direction.

1.6 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- B. Environmental Limitations: Do not apply concrete materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure.
- C. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 degrees F for water-based materials, and not exceeding 95 degrees F.

PART 2 - PRODUCTS

2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.

1. Use flexible or curved forms for curves with a radius 100 feet or less.

- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces and contains no PCBs or other restricted chemicals.

2.2 STEEL REINFORCEMENT

- A. Plain-Steel Welded Wire Reinforcement: ASTM A185, fabricated from as-drawn steel wire into flat sheets.
- B. Deformed-Steel Welded Wire Reinforcement: ASTM A497, flat sheet.
- C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.
- D. Galvanized Reinforcing Bars: ASTM A 767/A 767M, Class II zinc coated, hot-dip galvanized after fabrication and bending; with ASTM A 615/A 615M, Grade 60 deformed bars.
- E. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60, deformed bars; assembled with clips.
- F. Plain Steel Wire: ASTM A 82, as drawn.
- G. Deformed-Steel Wire: ASTM A 496.
- H. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.
- I. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.
- J. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice."
- K. Zinc Repair Material: ASTM A 780.

2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use one of the following cementitious materials, of the same type, brand, and source throughout the Project:
1. Portland Cement: ASTM C 150, Type I or II. Supplement with the following:
- a. Fly Ash: ASTM C 618, Class C or F.
- b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C 33, Class 4S coarse aggregate, uniformly graded. Provide aggregates from a single source.

- C. Water: ASTM C 94/C 94M.
- D. Air-Entraining Admixture: ASTM C 260.
- E. Chemical Admixtures: ASTM C 494/C 494M, of type suitable for application, certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

2.4 FIBER REINFORCEMENT

- A. Synthetic Fiber: Monofilament or fibrillated polypropylene fibers engineered and designed for use in concrete pavement, complying with ASTM C 1116, Type III.

2.5 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Spray-Applied Concrete Treatment: penetrating, colloidal silica concrete treatments and substrate protection, applied after finishing. Spray-Lock Concrete Protection or equal
- E. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.

2.6 AUXILIARY MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1752, cork or self-expanding cork.
- B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.
- C. Pavement-Marking Paint: Acrylic/latex type, low VOC, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, with drying time of less than 45 minutes.
 - 1. Color: As indicated.

2.7 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 301, with the following properties:

McCall Middle School Traffic Improvement Project
Town of Winchester, Massachusetts

1. Compressive Strength (28 Days): 3500 psi.
 2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
 3. Slump Limit: 4 inches, plus or minus 1 inch.
 4. Air Content: 6 percent plus or minus 1.5 percent for 3/4-inch nominal maximum aggregate size.
- B. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
- C. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements as follows:
1. Fly Ash or Pozzolan: 25 percent.
 2. Ground Granulated Blast-Furnace Slag: 50 percent.
 3. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent, with fly ash or pozzolan not exceeding 25 percent.
- D. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd.

2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116. Furnish batch certificates for each batch discharged and used in the Work.
1. When air temperature is between 85 degrees F and 90 degrees F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
1. For concrete mixes of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 2. For concrete mixes larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
- C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

3.4 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, to match jointing of existing adjacent concrete pavement.
- E. Edging: Tool edges of pavement and joints in concrete after initial floating with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

3.5 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.

- B. Moisten subbase to provide a uniform dampened condition at time concrete is placed.
- C. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
- D. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- E. Screed pavement surfaces with a straightedge and strike off.
- F. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- G. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When air temperature has fallen to or is expected to fall below 40 degrees F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F and not more than 80 degrees F at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.

3.6 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
 - 1. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.
- C. Slip-Resistive Aggregate Finish: Before final floating, spread slip-resistive aggregate finish on pavement surface according to manufacturer's written instructions.
 - 1. Cure concrete with curing compound recommended by slip-resistive aggregate manufacturer. Apply curing compound immediately after final finishing.
 - 2. After curing, lightly work surface with a steel wire brush or abrasive stone and water to expose nonslip aggregate.

3.7 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Colloidal Silica Treatment: As soon after concrete placement, floating, and/or troweling, so that it is hard enough for foot traffic or other surface loading without causing damage to the surface.
 - 1. Concrete shall not be treated with any other curing system including internal or externally applied, i.e., ASTM C309 membranes or cure and seal products.
 - 2. Concrete shall not be treated with sealers or densifiers, including silicate sealers, i.e., sodium, potassium, lithium, etc.
 - 3. Remove standing water.
 - 4. Do not burnish the surface or close pores, by over finishing with trowels.

3.8 PAVEMENT TOLERANCES

- A. Accessibility: Comply with requirements of Massachusetts Architectural Access Board and ADAAG requirements. Remove and replace paving that does not meet required tolerances, when measured with a 2 foot straightedge.
- B. Comply with tolerances of ACI 117 and as follows:
 - 1. Elevation: 1/4 inch.
 - 2. Thickness: Plus 3/8 inch, minus 1/4 inch.
 - 3. Surface: Gap below 10-foot- long, unlevelled straightedge not to exceed 1/4 inch.
 - 4. Joint Spacing: 3 inches.
 - 5. Contraction Joint Depth: Plus 1/4 inch, no minus.
 - 6. Joint Width: Plus 1/8 inch, no minus.

3.9 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Designer.
- B. Allow concrete pavement to cure for 28 days and be dry before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust.
- D. Apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

3.10 FIELD QUALITY CONTROL

- A. Independent Testing Agency: Cooperate with the Independent Testing Agency engaged by DCAMM for field quality control activities for the Work of this Section. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain at least 1 composite sample for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
 4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 degrees F and below and when 80 degrees F and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C 39/C 39M; test 1 specimen at 7 days and 2 specimens at 28 days.
 - a. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.
- B. Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- C. Test results shall be reported in writing to Designer, DCAMM Project Manager, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Designer but will not be used as sole basis for approval or rejection of concrete.
- E. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Designer.

- F. Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.
- G. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.
- B. Drill test cores, where directed by Designer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION

SECTION 321416
BRICK PAVING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section specifies:
 - 1. Clay brick pavers on bituminous/sand setting bed on bituminous concrete base. Paving to Match existing sidewalks.
- B. All work shall be done in accordance with the Standard Specifications Section 02514, Brick Paving, except as modified herein.
- C. Related Work Specified Elsewhere:
 - 2. Section 321216 - Asphalt Pavement
 - 3. Section 321313 – Concrete Paving
 - 4. Section 312000 - Earthwork -
 - 5. Section 321200 –Curbs

1.02 SUBMITTALS

- A. Samples:
 - 1. Brick: Submit full size samples of brick in sufficient number to show the extreme range of color shades, surface finish and texture but in any case at least ten (10) bricks.
- B. Tests
 - 1. Test report of brick paver shall be submitted.
 - 2. Testing shall be done by an independent testing laboratory. Test procedures shall conform to ASTM C67 methods, where applicable.
 - 3. Test report shall contain the following:
 - a. Compressive strength (PSI)
 - b. Absorption, 5 hr. submersion in cold water.
 - c. Absorption, 24 hr. submersion in cold water.
 - d. Maximum saturation coefficient
 - e. Abrasion index
 - f. Freeze thaw

1.03 REFERENCES

- E. ASTM C-902-87 - Pedestrian and Light Traffic Paving Brick
- F. ASTM C-1136-81 - Fine and Coarse Aggregate
- G. ASTM D-3381 - Viscosity Graded Asphalt Cement for Use in Pavement Constructions
- H. The "Standard Specifications" shall be taken to mean the Standard Specifications of the Massachusetts Department of Transportation.

McCall Middle School Traffic Improvement Project
Town of Winchester, Massachusetts

- I. ADAAG - Americans with Disabilities Act Accessibility Guidelines, U.S. Architectural and Transportation Barriers Compliance Boards, Washington, D.C. - Latest Edition.

1.04 MOCK-UP

- A. Provide a sample paving area of approximately 6' x 6' laid at the site. Location of the mock-up shall be at the direction of the Engineer. Sample shall show all the required patterns, methods of paving, expansion joints, variation of color of pavers, and sand swept joints. Paving samples shall be modified as necessary to meet the Engineer's approval and, once approved, shall be retained as a standard to which all brick paving shall conform.

1.05 QUALIFICATIONS

- A. Paver Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- B. Installer: Company specializing in performing the work of this section with three (3) years documented experience shall submit information on two previously completed projects of similar character to include project name and location.

1.06 DELIVERY STORAGE AND HANDLING

- A. All packaged materials shall be delivered to the site in original unopened containers clearly indicating manufacturer name, brand name, and other identifying information.
- B. Materials shall be stored in a dry location, off the ground and in such manner as to prevent damage or intrusion of foreign matter. All materials which have become damaged or otherwise unfit for use during delivery or storage shall be replaced at the expense of the Contractor.
- C. All masonry units shall be handled with care and where units must be stored outdoors, they shall be stored on platforms and shall be protected from the weather with tarpaulins or other approved means. Protection shall be maintained until units are used.

1.07 PRE-INSTALLATION CONFERENCE

- A. The Contractor shall request a formal site meeting with the Engineer one week prior to commencing the work of this section in order to verify his construction schedule and the sequencing of his work. Also at this time, any discrepancies between design plans and field conditions must be addressed.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Brick pavement shall conform to the following:
 - 1. All brick used for paving shall conform to the requirements of ASTM C902-87, Class

McCall Middle School Traffic Improvement Project
Town of Winchester, Massachusetts

SX, Type 1, Application PX.

2. Brick Pavers Shall be Boston City Hall Brick Pavers manufactured by Stiles and Hart or approved equal to match existing brick walk.
3. Brick pavers shall be supplied as listed below:
 - a. Brick pavers shall be equal to existing pavers being removed, adjacent pavers to remain, and color blends shall match existing.
 - b. Brick pavers shall be highly resistant to abrasion and shall have an average compression strength of 14,000 p.s.i. or greater. The nominal size shall be 4" x 8" x 2 1/4" inches. Brick pavers shall have a minimum 6% cold water absorption after 24 hours submersion tested in accordance with testing methods described in ASTM C-67 (latest edition).
 - c. All brick shall be sound and hard burned. No soft or under burned brick shall be acceptable and if included in the shipment, shall be immediately pulled out and removed from the site. Rejected brick shall be replaced at the Contractor's expense.
4. The color of pavers for pedestrian curb ramps shall be of a lighter tone providing sufficient contrast to satisfy the ADAAG requirements described in Appendix A4.29.
5. Brick pavers damaged in any manner will be rejected and replaced at Contractor's expense.
6. Paving brick shall be delivered in ample time so as not to delay the general progress of the work, and shall be delivered and stacked on the site at no additional cost to the Owner.

2.03 BITUMINOUS SETTING BED AND TACK COAT

- A. Asphalt cement to be used in the bituminous setting bed shall conform to ASTM designation D-3381. The viscosity shall be grade A.C. 10 or A.C. 20.
- B. Fine aggregate to be used in the bituminous setting bed shall be clean, hard sand with durable particles and shall be free from adherent coating, lumps of clay, alkali salts, and organic matter. It shall be uniformly graded from "coarse" to "fine" and all passing the No. 4 sieve, and it shall meet the gradation requirements when tested in accordance with the standard method of test for sieve or screen analysis of fine and coarse aggregates ASTM Designation C-136-81.
- C. Dried fine aggregate shall be combined with hot asphalt cement, and the mix shall be heated to approximately 300 degrees F. at an asphalt plant. The proportion of materials shall be seven (7) % asphalt cement and ninety-three (93) % fine aggregate. Each ton shall be by weight ratio of 145 lbs. asphalt to 1,855 lbs. sand. The Contractor shall determine the exact proportion to produce the best possible mixture for construction of the bituminous setting bed for the details shown.
- D. Neoprene-modified asphalt adhesive tack coat

McCall Middle School Traffic Improvement Project
Town of Winchester, Massachusetts

1. Mastic (asphalt adhesive) shall conform to the following:

Solids (base).....75 \pm 1%
Llbs/Gal.....8-8.5 lb
Solvent.....Mineral Spirits (over 100 degree Flash)

2. Base (2% Neoprene, 10% Asbestos-free Fibers, 88% Asphalt)
Melting Point---ASTM D-36..200 Degree F min.
Penetration--77 Degree F 100 gram load, 5 second (.1mm).. 23-27
Ductility--ASTM D-133-44 @ 25 Degree C 5 cms/per minute125 Cm Min.

2.04 BITUMINOUS ASPHALT BASE COURSE

- A. Concrete for base for Brick Paving shall conform to the requirements of Section 321216, Asphalt Paving, of these Standard Specifications.

2.05 CLEANING SOLUTION

- A. Cleaning solution shall be type recommended by paver manufacturer.
- B. All cleaning products shall be environmentally safe and be approved by local and State health agencies.

3.01 PREPARATION OF BASE COURSE

- A. Prepare and furnish graded gravel base course as specified in Section 312000 - Earthwork, of the Standard Specifications.

3.02 BITUMINOUS CONCRETE BASE COURSE

- A. Provide bituminous concrete base course as specified in Section 321216- where called for on the Drawings.
- BB. Finished grades of basecourse shall be such that the required finished grade of pavement is achieved without exceeding the setting bed tolerances. Surface of basecourse shall not deviate more than 1/4" in ten feet.
- F. Contractor to verify substrate is ready to support pavers and imposed loads.
- G. Contractor to verify gradients and elevations of substrate are correct. If not approved by the Engineer, the Contractor shall remove the area and replace it at his own expense.
- H. Evidence of inadequate base shall be brought to the immediate attention of the Engineer.
- I. Start of the work of this Section shall constitute acceptance of basecourse.

3.03 INSTALLATION OF BITUMINOUS SETTING BED OVER BASECOURSE

- A. Prior to placing bituminous setting bed on concrete base, slab shall have been cured a minimum of 6 days, according to the methods required in Section 03300, Cast-In-Place

Concrete.

- B. Sweep surface clean of loose matter.
- C. Place 3/4" deep control bars directly over the base. The depth control bars must be set carefully to bring the pavers, when laid, to proper grade. Thickness of the finished setting bed shall be no more than 1" or less than 1/2" inch.
- D. The setting bed shall be rolled with a power roller to a nominal depth of 3/4" while still hot. The thickness shall be adjusted so that when the brick pavers are placed, the top surface of the pavers will be at the required finished grade. However under no circumstances shall the setting bed exceed 1" depth.
- E. A coating of two (2) percent Neoprene-modified asphalt adhesive shall be applied by squeegee or toweling over the top surface of the bituminous setting bed so as to provide a bond under the pavers. If it is troweled, the trowel shall be serrated with serrations not to exceed one-sixteenth (1/16) of an inch.

3.04 INSTALLATION OF PAVERS

- A. After the modified asphalt adhesive is applied, carefully place the pavers by hand in straight courses with hand tight joints and uniform top surface. Good alignment must be kept, and the pattern shall be that shown on the plans and details.
- B. Brick pavers with chips, cracks, stains or other defects which might be visible in the finished work shall be rejected and replaced at the Contractor's expense.
- C. All brick which must be cut shall be cut with a water-cooled, cutoff wheel masonry saw using a diamond blade.
 - 1. Except as required to produce pattern shown on the Drawings, all brick shall be laid out to minimize cutting.
- D. Pavers shall be set true to line and grade and in the pattern shown on the Drawings and details.
- E. There shall be no deviation from true grade greater than one-quarter inch in ten feet. All finished paved areas shall slope to drain at a minimum of 1/8" per foot. All paving shall be checked with a 10' straightedge.

3.05 JOINT TREATMENT

- A. Hand tight joints shall read from 0" to maximum 1/8".
- B. Sweep sand until joints are completely filled. Fog lightly with water.

3.06 CLEANING

- A. Clean soiled surfaces using cleaning solution. Do not harm pavers, joint materials, or adjacent surfaces. Use only cleaning materials which have been approved by the brick manufacturer.

McCall Middle School Traffic Improvement Project
Town of Winchester, Massachusetts

- B. Use non-metallic tools in cleaning operations.
- C. Rinse surfaces with clean water.
- D. Broom clean paving surfaces. Dispose of excess sand.

END OF SECTION

SECTION 329200

TURF AND GRASSES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Seeding.
 - 2. Topsoil.
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
 - 1. Section 312000 - EARTH MOVING for excavation, filling and backfilling, and rough grading.

1.3 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- C. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- D. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.

- B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
 - 1. Certification of each seed mixture for sod. Include identification of source and name and telephone number of supplier.
- C. Qualification Data: For qualified landscape Installer.
- D. Product Certificates: For soil amendments and fertilizers, from manufacturer.
- E. Material Test Reports: For existing surface soil and imported topsoil.
- F. Planting Schedule: Indicating anticipated planting dates for each type of planting.
- G. Maintenance Instructions: Recommended procedures to be established by Authority for maintenance of turf during a calendar year. Submit before expiration of required maintenance periods.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf establishment. Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.
- B. Contractor's Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of topsoil.
- D. Topsoil Suitability: Report suitability of topsoil for turf growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce a satisfactory topsoil.
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.7 PROJECT CONDITIONS

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from the date of Certificate of Agency Use and Occupancy.
 - 1. Spring Planting: April 1 to June 15.
 - 2. Fall Planting: August 15 to October 1.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit. Do not plant during inclement weather including but not limited to heavy rain, high winds, frost and similar conditions.

1.8 MAINTENANCE SERVICE

- A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:
 - 1. Seeded Turf: 60 days from the date of Certificate of Agency Use and Occupancy. Guarantees or warranties that start at the date of shipment from the factory, or from the completion date of an individual portion of the project, are not acceptable.
 - a. When full maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

PART 2 - PRODUCTS

2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with Association of Official Seed Analysts' "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species: Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:
 - 1. General Turf Areas:
 - a. Perennial Ryegrass: 40%
 - b. Chewings Fescue: 30%
 - c. Kentucky Bluegrass: 30%

2.2 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.
 - 1. Topsoil Source: Import topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.
 - 2. Topsoil Source: Amend existing in-place surface soil to produce topsoil. Verify suitability of surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - a. Surface soil may be supplemented with imported or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

2.3 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent.
- B. Sand: Clean, washed, natural or manufactured, free of toxic materials, gradation suitable for use.

2.4 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.

2.5 PLANTING ACCESSORIES

- A. Selective Herbicides: EPA registered and approved, of type recommended by manufacturer for application.

2.6 FERTILIZER

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 - 1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.

2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
- B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.7 EROSION-CONTROL MATERIALS

- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.
- B. Erosion-Control Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, a minimum of 0.92 lb/sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive turf and grass for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

- A. Limit turf subgrade preparation to areas to be planted.
- B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 8 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Apply fertilizer directly to subgrade before loosening.
 2. Thoroughly blend planting soil off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
 3. Spread planting soil to a depth of 6 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
 - a. Reduce elevation of planting soil to allow for soil thickness of sod.
- C. Unchanged Subgrades: If turf are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare surface soil as follows:
1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
 2. Loosen surface soil to a depth of at least of 8 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 6 inches of soil. Till soil to a homogeneous mixture of fine texture.
 - a. Apply fertilizer directly to surface soil before loosening.
 3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
 4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.
- D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll to grade and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.
- E. Moisten prepared turf areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Before planting, obtain Designer's acceptance of finish grading; restore areas if eroded or otherwise disturbed after finish grading and before planting.
- 3.4 SEEDING
- A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
 1. Do not use wet seed or seed that is moldy or otherwise damaged.
 - B. Sow seed at the rate of 3 to 4 lb/1000 sq. ft.
 - C. Rake seed lightly into top 1/8 inch of topsoil, roll lightly, and water with fine spray.
 - D. Protect seeded areas with slopes exceeding 1:6 with erosion-control fiber mesh and 1:4 with erosion-control blankets installed and stapled according to manufacturer's written instructions.

3.5 HYDROSEEDING

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
 - 1. Mix slurry with nonasphaltic tackifier.
 - 2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply mulch at a minimum rate of 1500-lb/acre dry weight but not less than the rate required to obtain specified seed-sowing rate.

3.6 TURF MAINTENANCE

- A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
 - 1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
 - 2. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.
- B. Watering: Provide and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.
 - 1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
 - 2. Water turf at a minimum rate of 1 inch per week.
- C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain height appropriate for species without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet.
- D. Turf Postfertilization: Apply fertilizer after initial mowing and when grass is dry. Use fertilizer that will provide actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.
- E. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify the Owner before each application is performed.

3.7 SATISFACTORY TURF

- A. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches .
- B. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
- C. Reestablish turf that do not comply with requirements and continue maintenance until turf are satisfactory.

3.8 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period and remove after turf is established.
- C. Remove erosion-control measures after grass establishment period.

END OF SECTION

SECTION 329300

PLANTING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work shall consist of furnishing of plant material in accordance with these specifications and as shown on the construction plans and drawings
- B. Work includes preparing of planting areas, testing and preparing for planting soil, planting of plant material and maintaining during maintenance period.
- C. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
 - 1. Section 310000-Earthwork
 - 2. Section 321200 Paving
 - 3. Section 329200 Turf and Grass

1.3 REFERENCES, STANDARDS, AND SPECIFICATIONS

- A. "Standardized Plant Names: "American Joint Committee on Horticultural Nomenclature," 1942 Edition.
- B. ANSI Z60.1-2004 "American Standard for Nursery Stock", American Association of Nurserymen, 2004 Edition.

1.4 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- C. Finish Grade: Elevation of finished surface of planting soil.
- D. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

- E. Organic Pesticide: An OMRI listed substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides.
- F. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- G. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- H. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.
- I. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
- J. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- K. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.5 SUBMITTALS

- A. Product Certificates: For each type of product indicated, including soils.
- B. Submit certified laboratory test reports for topsoil composition specified in USDA Soil Survey Investigation Report No. 1. Report shall include Nitrogen, Phosphorus, and Potassium requirements, organic matter, content and pH value of the soil.
- C. Samples of wood chip mulch.
- D. Maintenance Instructions: Submit typewritten instructions and recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit prior to expiration of the required maintenance period.
- A. Submit a planting schedule showing scheduled dates for each type of planting in each area of the site.

1.6 QUALITY ASSURANCE

- A. The Contractor shall subcontract work under this section to a single firm specializing in landscape work and approved by the Owner's Representative with a minimum of five (5) years of documented experience.

- B. Plants shall have been grown in a licensed nursery; plant growth, pruning and cultivation shall have been supervised by a trained and licensed nurseryman.
- C. The Owner's Representative reserves the right to inspect plants either at the place of growth or at the site prior to planting, for compliance with the requirements for name, variety, size, and quality.
- D. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 - 1. Pesticide Applicator: State licensed, commercial.
- E. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Balled and Burlapped (B&B) plants shall contain, in the ball, as much undisturbed soil and as many fibrous roots as is possible. Roots and soil shall be securely and tightly wrapped with burlap, and the burlap shall be held in place with cord.
 - 1. Balled and Burlapped plants shall be handled in a manner which will neither loosen the ball nor damage the plants. Plants having loose earth balls will be rejected. Plants shall be lifted by the ball.
- B. Container grown plants shall be kept moist until planted and shall be handled by the container.
- C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.
- D. Handle planting stock by the root ball or container.
- E. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F until planting.
- F. Deliver plants after preparations for planting have been completed, and install plants immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1.8 REJECTION OF PLANT MATERIAL

- A. Evidence of inadequate protection following digging, carelessness while in transit, or improper handling or storage shall be cause for rejection.
- B. Rejected plants will be removed immediately from the site by the Contractor.

- C. All rejected plant materials shall be replaced with the same species as specified. The cost of replacement shall be borne by the Contractor.

1.9 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
 - b. Structural failures including plantings falling or blowing over.
 - 2. Warranty Periods from Date of Substantial Completion:
 - a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
 - b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.
 - c. Annuals: Three months.

1.10 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.
 - 1. Maintenance Period for Trees and Shrubs: Twelve months from date of Substantial Completion.
 - 2. Maintenance Period for Ground Cover and Other Plants: six months from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

- A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- B. No substitutions will be permitted unless authorized by Owner's Representative. Requests for substitutions shall be written. Before changes or substitutions can be made due to unavailability of plant material, submit satisfactory evidence that materials are in fact not available.

- C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- D. If a range of size is given, no plant shall be less than the minimum size and not less than 50% of the plants shall be as large as the upper half of the specified range. The measurements specified are the minimum size acceptable and are the measurements after pruning, where pruning is required.
- E. Plants that meet the measurements specified, but do not possess a normal balance between height and spread shall be rejected. Thin, poorly branched, or sparsely rooted plants will be rejected, regardless of their otherwise full compliance with ANS Standards. Rejected plants will be replaced at the Contractor's expense.
- F. Plants shall not be pruned prior to delivery
- G. Label all plants. Plant material labels shall be durable, legible labels stating the correct plant name and size using weather resistant ink or embossed process. Attach securely to all plants, bundles, and containers of plant material delivered being careful that those attached directly to plants will not restrict growth.

2.2 SELECTION OF NURSERY STOCK

- B. At least twenty (20) days prior to the expected planting date, the Contractor shall request, in writing, that the Owner's Representative provide a representative to select and tag all trees to be planted under this section. This request shall be made ten (10) days prior to the date on which stock selections are to be made. The letter of request shall also have attached a letter of certification from the supplier attesting to the fact that the stock to be selected from is, in fact, the patented tree required under this Section.
- C. All plants shall be subject to approval by the Owner's Representative upon delivery for conformity to specification requirements. Plants not conforming to the specifications shall be rejected and replaced at the Contractor's expense.

1.2 DIGGING PLANTS

- A. Plants shall not be dug at the nursery until they have been approved by the Owner's Representative and the Contractor is ready to transport them from their original locations to the site of the work or an acceptable storage location.
- B. Immediately before digging spray all evergreen and deciduous plant material in full leaf with antidesiccant, applying an adequate film over trunks, branches, twigs and foliage.
- C. Dig, ball and burlap (B&B) plants with firm natural balls of earth of diameter not less than that recommended by the "American Standard for Nursery Stock", and of sufficient depth to include the fibrous and feeding roots. All plants which are six inches in caliper or over shall be double burlapped. All burlap materials shall be biodegradable and of material that will allow the root system to penetrate the burlap wrap.

- D. Plants shall be dug up and prepared for shipment in a manner that will not cause damage to the branches, shape and future development of the plants after replanting. All plant material being transported shall be secured and covered while in transit.
- E. Plants moved with a ball will not be accepted if the ball is cracked or broken before or during planting operations.
- F. No plants shall be dug and shipped with plastic covered root balls. Plants arriving with any plastic shall be rejected and replaced at the Contractor's expense.

1.3 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural, free-flowing, dolomitic limestone containing a minimum of 85 percent calcium carbonate equivalent and as follows:
 - 1. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.
- B. Perlite: Horticultural perlite, soil amendment grade.
- C. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 sieve.
- D. Sand: Clean, washed, natural or manufactured, and free of toxic materials.

1.4 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1/2-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings;
- B. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth. The Contractor shall furnish information as to the kind of disinfectant or chemicals, if any, that may have been used in storage of or otherwise in connection with the manure.

2.3 FERTILIZERS

- A. Commercial Fertilizer: Commercial-grade organic complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 100 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium. Proper composition shall be determined by soil testing for deciduous and evergreen plants.

2.4 PLANTING SOILS

- A. Loam shall be a "fine sandy loam" or a "sandy loam" determined by mechanical analysis and based on the USDA Soil Conservation Service, Soil Classification System. It shall be of

uniform composition with no admixture of subsoil. It shall be obtained from naturally well-drained areas, which have never been stripped before and have a history of satisfactory vegetative growth except that Loam stockpiled from on-site sources, may be used if it meets the requirements of these specifications.

1. Loam shall have an acidity range of pH 5.5 to pH 6.5 and shall contain not less than 4% or more than 12% organic matter as determined by the loss on ignition of oven-dried samples. Test samples shall be oven dried to a constant weight at a temperature of 230 degrees F plus or minus 9 degrees.
2. Loam shall be screened and free of stones greater than 3/4" inch, lumps, plants and their roots, debris and other extraneous matter over 1/2" inch in longest dimension, or excess quantities of smaller pieces of such material. It shall not contain toxic substances harmful to humans, animals or plant growth.
3. Loam shall conform to the following mechanical analysis:

<u>Textural Class</u>	<u>% of Total Wt.</u>	<u>Average %</u>
Sand (0.05-2.0mm dia.)	45 to 75	60
Silt (0.002-0.05 mm dia.)	15 to 35	25
Clay (<0.002 mm dia.)	5 to 25	15

4. 95% of loam shall pass a 2.00 mm sieve.

2.5 MULCHES

- A. Premium Blend Pine Bark Mulch: Mulch shall be 100% fine shredded premium pine bark product not younger than two years, and each piece shall not exceed two inches in size. Bark shall have a moisture content of not more than 12 percent, shall be obtained from disease free pine, and shall contain no noxious weed seeds, soil, sawdust, and substances toxic to vegetation.

2.6 TREE ROOTBALL ANCHORING SYSTEM

- A. Trees are to be supported with an underground support system to hold root ball securely in place. Materials to be used are Duckbill Earth Anchoring Systems Kit, Model 88-RBK, or approved equal, manufactured by Foresight Products, Inc. 6430 East 49th Drive, Commerce University, Colorado 80022 (1-800-325-5360).
 1. Anchoring system must be recommended by manufacturer for specific caliper or root ball size installed.
 2. System shall include Duckbill Model 88-DB1 earth anchors or approved equal anchor in normal soil.
 3. System shall include wood frame, as detailed in the Drawings for stabilizing root balls and attachment of anchors.
 4. System shall include galvanized tensioning cable for adjustment of anchor attachment

2.7 ORGANIC PESTICIDES

- A. General: Organic pesticides registered and approved by EPA and OMRI listed, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use pesticides unless authorized in writing by authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PLANTING AREA ESTABLISHMENT

- A. Loosen subgrade of planting areas to a minimum depth of 6 inches. Remove stones larger than 1-1/2 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Apply fertilizer directly to subgrade before loosening.
 - 2. Thoroughly blend planting soil off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
- B. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.2 EXCAVATION FOR TREES AND SHRUBS

- A. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
 - A. Excavate approximately three times as wide as ball diameter.
 - B. Do not excavate deeper than depth of the root ball, measured from the trunk flare to the bottom of the root ball.
 - C. Drainage: Test all planting pits for adequate percolation. If subsoil conditions indicate retention of water in planting areas, or if seepage or other evidence indicating presence of underground water exists, notify Owner's Representative before backfilling.
 - D. Obstructions: If rock, underground construction, or other obstructions are encountered in excavation for planting of trees, notify Owner's Representative. New locations may be selected by Owner's Representative or change order may be issued to direct removal of obstructions to depth of not less than 6" below required planting depth.
- C. Subsoil and topsoil removed from excavations may not be used as planting soil without approval.

3.3 TREE, SHRUB, AND VINE PLANTING

- A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1.
- B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
- C. Set stock plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
- D. Use planting soil for backfill.
- E. Balled and Burlapped: After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets completely from root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
- F. Balled and Potted or Container-Grown: Carefully remove root ball from container without damaging root ball or plant.
- G. Fabric Bag-Grown Stock: Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
- H. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
- I. Place planting tablets in each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
- J. Continue backfilling process. Water again after placing and tamping final layer of soil.
- K. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.4 TREE, SHRUB, AND VINE PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.
- B. Prune trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Owner's Representative, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

3.5 GROUND COVER AND PLANT PLANTING

- A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated in even rows with triangular spacing.
- B. Use planting soil for backfill.

- C. Dig holes large enough to allow spreading of roots.
- D. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- E. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- F. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.6 PLANTING AREA MULCHING

- A. Mulch backfilled surfaces of planting areas and other areas indicated.
- B. Trees and Tree-like Shrubs in Turf Areas: Apply organic mulch ring of 3-inch average thickness, with 12-inch radius around trunks or stems. Do not place mulch within 3 inches of trunks or stems.
- C. Organic Mulch in Planting Areas: Apply 3-inch average thickness of mulch extending 12 inches beyond edge of individual planting pit or trench and over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.7 PROTECTION

- A. No heavy equipment shall be moved over the planted turf areas unless the soil is again prepared, graded, leveled, and replanted by seed or sod with appropriate permanent grass species. It will be the responsibility of this Contractor to protect all paving surfaces, curbs, utilities, plant materials, and any other existing improvements from damage. Any property damage resulting from, arising out of, or caused by the operations of the Contractor shall be repaired or replaced by the Contractor at no cost to the Owner.

3.8 PLANT MAINTENANCE

- A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.
- B. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use practices to minimize the use of pesticides and reduce hazards.
- D. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

3.9 CLEAN-UP

- A. After completion of the work, the Contractor shall remove all debris, materials, rubbish, excess dirt, etc. from the site and dispose of in accordance with local regulations. The site shall be left clean, presentable and satisfactory.

END OF SECTION

SECTION 337000

SITE LIGHTING

PART 1 – GENERAL

1.01 REFERENCES

- A. The work specified in this Section consists of furnishing, installing, connecting and testing the following components and systems to be used in the street lighting.
1. Raceway Systems.
 2. Handholes
 3. Boxes
 4. Wiring Devices
 5. Lighting Fixtures
 6. Light Poles
 7. Control Devices
 8. Anchor Bolts
 9. Tenons and Arms
 10. Photocell

1.02 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of these Specifications to the extent referenced. The publications are referred to in the text by basic designation only. In case of conflict between provisions of codes, laws, ordinances, and these Specifications, including the Contract Drawings, the more stringent requirements will apply.
1. State Building Code
 2. State Electrical Code
 3. National Fire Protection Association (NFPA)
 4. Local Town Regulations and By-laws
 5. Underwriter's Laboratories, Inc. (UL)
 6. National Electrical Manufacturer's Association (NEMA)
 7. American National Standards Institute (ANSI)

1.03 RELATED WORK

- A. The following work is to be performed under the following related Sections:

SECTION 033000 CAST IN PLACE CONCRETE for light pole bases
SECTION 312000 EXCAVATION

1.04 SUBMITTALS

- A. Manufacturer's Data. Manufacturer's data which clearly indicates that the proposed material or equipment complies with Contract Specifications requirements shall be submitted for the following as necessary:
1. Conduit and fittings (each type)

2. Receptacles
3. Device plates
4. Junction boxes
5. Wiring Devices
6. Fuses
7. Lighting Fixtures and Lamps
8. Light poles and pole Arms
9. Photoelectric Switches

B. Shop Drawings. Shop Drawings shall be submitted for the following:

1. Lighting Fixtures/Luminaire
2. Light Poles and Pole Arms

PART 2 - PRODUCTS

2.01 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Ship each unit or component securely packaged and labeled for safe handling in shipment and to avoid damage or distortion.
- B. Mark each item, unit or component in accordance with applicable reference standard.
- C. Store Materials in secure and dry facility and in original packaging in a manner to prevent soiling, physical damage, wetting or corrosion prior to installation.
- D. Where possible maintain protective coverings until installation is complete and remove such covers as part of final clean up.
- E. Packaging: Prior to shipment, pole shafts, arms and cast bases are to be wrapped in 0.125" thick, ultraviolet- inhibiting plastic backed foam. Pole shafts shall also be protected at the dunnage support points during transport.

2.02 MATERIALS AND EQUIPMENT, GENERAL

- A. All materials, equipment, and devices shall, as a minimum, meet the requirements of UL, where UL standards are established for those items, and the requirements of NFPA 70. All equipment and materials provided shall be new unless specified otherwise or indicated.

2.03 CONDUIT AND FITTINGS

A Rigid Metal Conduit

1. Hot-dipped galvanized steel conduit (GRS), shall be threaded and shall conform to UL 6 and ANSI C80.1. GRS shall be PVC coated.
2. All preformed elbows shall be similar in construction to, and of a type designed for use with, the conduit and shall conform to UL 6.
3. All fittings shall be threaded and shall conform to NEMA FB-1

B. PVC Conduit

1. Conduit and fittings shall be schedule 80 conforming to NEMA TC-2 and UL 651

2.04 BOXES AND FITTINGS

A. General:

1. Boxes and fittings shall be metallic, unless otherwise shown on the Contract Drawings, and shall conform to NEMA OS1, NEMA 250, UL 50, UL 514A, UL 514B and NFPA 70.

B. Junction and Pull Boxes:

1. Galvanized, code-gauge, sheet-steel junction and pull boxes and covers for interior locations of types, shapes and sizes to suit each respective location and installation.

C. Conduit Bodies:

Galvanized cast-metal conduit bodies, of types, shapes and sizes to suit each respective location and installation; provided with threaded-conduit-entrance hubs, removable covers and stainless steel or brass screws.

2.05 WIRING DEVICES

A. Device Plates:

1. All device plates shall be 0.04 inch thick minimum conforming to the test and material requirement of FS W-P-455, and provided with struck-up beveled edges and void of sharp corners and burrs. All device plates shall be one-piece; sectional plates are not permitted.
2. Device plates for exposed work shall be cast aluminum or galvanized steel.

2.07 CONNECTORS, FUSES AND SPLICING MATERIALS

- A. Street light connectors shall be suitable for a range of conductors.
- B. No wire shall be drawn to any conduit until all work which may cause cable damage is complete
- C. All wire shall be continuous from handhole to handhole without splices in conduits. A splice will be required for each circuit wire at each and every pull box. All wires shall extend 24" above the pull box, connected at end and rolled back into pull box.
- D. All wire terminals, taps and splices shall be made secure with connectors, splicing materials and methods as required.
- E. All splices in pull boxes shall be with solderless or split bolt connectors. The neutral and ground connection in the post top shall be with an insulated pressure connector. The hot line connection in the post top shall be with an approved street light fuse connector.
- F. All incoming and outgoing wires shall be banded with ½ inch color marking tape at two locations 6 inches and 28 inches from the taped splice.from
- G. Grounding

1. Cartridge Fuses, Current Limiting Type (Class R): UL 198E, Class RK 5, time delay type. Associated fuse holders shall be class R only.
 2. Grounding: coatings and rust on conduits and grounding rods shall be removed at the location where ground fittings are to be installed.
 3. Bare copper conductor shall be connected to the continuous insulated bonding lead which shall be identified with green marking tape. Bonding leads on posts shall be insulated #10 AWG, marked green and extended to the nearest pull box and interconnected to the #4 AWG, which is connected to the ground rod.
 4. All grounding shall conform to the applicable provisions of the National Electric Code.
- H. Field Tests: Contractor shall perform the following field test prior to connecting to operating equipment in the presence of the Engineer and results submitted for approval:
1. Test for continuity
 2. Test for ground
 3. Test for insulation resistance
 4. Functional tests.

2.08 LIGHTING FIXTURES

A. Street Light Type I:

1. The cobra-head light is intended for installation on a concrete post. The specifications are based on an approved sample which has been thoroughly field tested. Methods of manufacture are based on recognized procedures for joining copper material and material weights are based on providing a substantial unit that has proven to be suitable for street lighting use.
2. Fixture shall be supplied by CREE or approved equal, ANSI C136.31-2001 certified, 3G. The fixture shall match the current standard in Winchester, MA as shown on the construction drawings. The 'XSP Series LED Street/Area Luminaire- Version-B' is indicated in this specification and should be used as a standard of quality and dimensional requirements.
3. The luminaire shall be suitable for attachment means a horizontal tenon. Mounts on 1.25" (32mm) IP, 1.66" (42mm) O.D. or 2" (51mm) IP, 2.375" (60mm) O.D. horizontal tenon (minimum 8" [203mm] in length) and is adjustable +/- 5° to allow for fixture leveling.
4. Luminaire is secured with two mounting bolts
5. Luminaire housings shall be of die cast aluminum with UV stabilized polymeric door. Colorfast DeltaGuard® finish or approved equal features an E-Coat epoxy primer with silver powder topcoat
6. Electrical System:

McCall Middle School Traffic Improvement Project
Town of Winchester, Massachusetts

- a. Input Voltage: 120-277V, 50/60Hz
- b. Power Factor: > 0.9 at full load
- c. Total Harmonic Distortion: < 20% at full load
- d. Class 2 driver
- e. Integral 10kV surge suppression protection standard
- f. When code dictates fusing, a slow blow fuse or type C/D breaker should be used to address inrush current
- g. 0-10V dimming capabilities. Controls by others
- h. 10V Source Current: 0.15mA
- i. 10kV surge suppression protection tested in accordance with IEEE/ANSI C62.41.2

B. Street Light Type II:

- 1. The post top lantern is intended for installation on a cast iron lamp post. The specifications are based on an approved sample which has been thoroughly field tested. Methods of manufacture are based on recognized procedures for joining copper material and material weights are based on providing a substantial unit that has proven to be suitable for street lighting use.
- 2. Luminaire shall be supplied by Spring City Electrical Mfg. Co.- 1 S Main St, Spring City, PA 19475 or approved equal. The lantern shall match the current standard in Winchester, MA as shown on the construction drawings. The 'Jefferson' luminaire is indicated in this specification and should be used as a standard of quality and dimensional requirements.
- 3. The luminaire shall be suitable for attachment means a 3" diameter tenon by 3" high.
- 4. Luminaire housings shall be of cast aluminum ANSI 356 Per ASTM B26-95. The luminaire shall be hexagonal in shape and assembled by welding the fitter to the decorative cage assembly. The roof shall be mechanically fastened to the assembly. The decorative roof casting, shall utilize the COOLCAST Technology. The decorative roof casting, shall utilize the COOLCAST Technology and must provide over 250 square inches of casting to outside air. The overall luminaire dimensions shall be 39-7/8 inches in height and 20-1/2 inches in width. Spring City Catalog No. Cat# ALMJFF-M1-LE080-EVX-2G3-40-CR3-YPBP-FJF-CU, or approved equal.
- 5. Electrical System:
 - a. Each 80 watt luminaire to be furnished with (1) internally mounted 100-watt driver for operation at 120, 208, 240, or 277 volt. The drivers shall produce a constant current at 350 mA.
 - b. The system wattage shall not exceed 82 system watts. The LED light engine shall consist of (36) Cree XTE 1-watt LED's.
 - c. The driver assembly shall be removed and installed using (3) stainless steel fasteners.
 - d. The electrical system shall be protected by a minimum of a 10kV surge suppressor.
 - e. Only copper wiring shall be used in the compartment. Harness and wiring insulation shall be THWN rated for 105°C and 600 volts.
 - f. The luminaires shall be internally labeled in accordance with ANSI C136.22 and shall include manufacturer's name and catalog number, month and year of manufacture, line input voltage, frequency if other than 60 hertz, ballast/driver type.

2.09 Light Posts/Poles

A. Light Pole for Street Light Type I

1. Light pole for Street Light Type I shall be fiber reinforced, air entrained 7,000 PSI concrete to match existing standards for the Town of Winchester, MA.
2. Shape: Tapered pole, octagonal cross section
3. Installation: Direct burial
4. Cap: Aluminum tenon, ASTM B-2 and cap to match existing poles.
5. Handhole: Aluminum Handhole, ASTM B-26
6. Interior Cable: 11 GA Galvanized spiral wrap, 4" pitch around 5/16" prestress cable, ASTM A-21, 250 KSI min.
7. Color: to match existing poles.
8. Arm/bracket: aluminum to match existing light poles.

B. The lamp post for Street Light Type II:

1. Post shall be a one-piece, heavy wall iron casting per ASTM Specification A48-83, Class 30 as detailed in these specifications. Poles cast from aluminum and poles constructed of two castings (column and base), connected by threading, bolting or welding will not be considered equal to the specification.
2. The "base plate" section of the pole shall measure 15" square x 1" thick and shall include (4) 1 1/4" diameter clearance holes for 1" diameter anchor bolts. An access door shall be provided in the pole for all wiring and grounding connections. Opposite the wiring access door opening, there shall be a boss cast integral with the pole that is blind-tapped for the installation of a 1/4" X 20 – grounding lug.
3. The upper "column" section of the lamp post shall be an 8 flat flute design, tapering from 5" OD at bottom of 3 1/2" OD at the top and include a 3" diameter x 3 1/2" high tenon to facilitate the luminaire mounting.
4. A ladder rest casting shall be provided with each light poles and designed to slip over the pole tenon and held in the intended orientation with stainless steel set screws.
5. Each pole shall be supplied with a set of (4) 1" diameter x 30" long + 4" hook anchor bolts. Each anchor bolt shall be supplied with H.D. galvanized steel hardware consisting of (2) 3/4 hex nut, (2) flat washer, (2) lock washers.
6. Finish: Polyester Urethane, Triglycidyl Isocyanurate (TGIC) powder coat.
7. Surface Preparation – All exterior surfaces shall be prepared for painting by sweep blasting to the current revision of ASTM D6386 requirements utilizing cast steel abrasives conforming to the Society of Automotive Engineers (SAE) Recommended Practice J827. The blast method used is a recirculating, closed cycle centrifugal wheel system with abrasives conforming to (SAE) Shot Number S280.

8. Coating – The prepared surfaces shall be coated with Polyester Urethane, TGIC (Triglycidyl Isocyanurate) Polyester, to an average dry film thickness (DFT) of 4.0 mils (0.004”). The coating shall be electrostatically applied and cured in a gas fired convection oven. The thermosetting powder resin shall provide adhesion that meets 5A or 5B classifications of ASTM D3359. Color: Gloss Black

PART 3 - CONSTRUCTION METHODS

1.01 INSTALLATION

- A. General Requirements: Electrical installation shall conform to the requirements of ANSI C2, NFPA 70, Massachusetts Electrical Code, and to the requirements specified herein.
- B. Wiring Methods: Wiring method shall be insulated conductors installed in conduit, except where specifically indicated or specified otherwise, or required by NFPA 70 to be installed otherwise. An insulated equipment grounding conductor shall be provided in all feeder and branch circuits.
- C. Conduit Application:
 1. Rigid Steel Conduit:
 - a. Shall be used for all conduit runs, below all paved non-sidewalk areas.
 2. Rigid Nonmetallic Conduit: Shall be used:
 - a. For installation below all brick paved sidewalks.
 - b. Conduit(s) shall be connected to rigid conduit before all non-sidewalk paved areas.
- D. Conduit Installation Requirements:
 1. General: Keep conduits at least 6 inches below the sidewalk paving.
 2. Minimum Conduit Sizes:
 - a. Exposed conduit runs shall be 1 inch minimum.
 3. Pull Wires: All empty conduits shall be provided with plastic pull wire having not less than 200 pound tensile strength.
- E. Boxes and Fittings:
 1. Provide boxes and fittings in the wiring or raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Boxes for metallic raceways shall be of the cast-metal hub type when located in normally wet locations, and surface mounted.

Each box shall have the volume required by NFPA 70 for the number of conductors enclosed in the box. Boxes for mounting lighting fixtures shall be not less than four (4) inches square.

2. Construct pull boxes of not less than the minimum size required by NFPA 70 of code-gauge galvanized sheet steel. Furnish boxes with screw-fastened covers.
 - F. Wiring devices: install as shown on the Contract Drawings, in accordance with the manufacturer's installation procedures and applicable requirements of NFPA 70.
- 3.02 FIELD TESTS AND INSPECTIONS
- A. General: The Contractor shall provide all test equipment and personnel and submit written copies of all test results.
 - B. Instruments used for measurements shall be accurate. Provide calibration histories for each instrument for examination. Calibration of each test instrument shall be by an approved laboratory or by the instrument manufacturer. The Engineer has the right to request instrument recalibration, or use of other instruments and test methodology where accuracy of readings is questionable. Instrument's application shall comply with the instrument manufacturer's certified instructions.
 - C. Wiring System Tests: Shall be performed as specified in this Section
 - D. Grounding System Tests: Shall be performed as specified in this Section
 - E. Devices Subject to Manual Operation: Each device subject to manual operation shall be operated at least five times, demonstrating satisfactory operation each time.

PART 4 – PRODUCT WARRANTY

- 4.01 Product Warranty: The cast ductile iron pole shall be warranted for a period of twenty-five years of normal use from date of installation. Damage to the cast ductile iron bases from vehicles is included within the terms of normal use. The paint finish shall guarantee against defects in material and workmanship while in proper usage for a period of not less than three years from date of installation.

SECTION 344113
TRAFFIC SIGNAGE

PART I - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Solar Powered Rectangular Rapid Flash Beacon (RRFB) Assembly: in accordance with the contract documents or directions of the Engineer. All materials and labor necessary to complete the work of this Section to provide a complete functioning RRFB system including but not limited to the following:
 - 1. Excavation and disposal.
 - 2. Concrete foundation
 - 3. Traffic signal pole and base
 - 4. Control box and control systems
 - 5. Conduit
 - 6. Push button and sign
 - 7. Rectangular Rapid Flash Beacon
 - 8. Solar engine assembly
 - 9. Signs as specified
 - 10. Communication devices, control systems
 - 11. Steel bands and attachment hardware
 - 12. Any required adjustment to utilities and incidental work required.
- B. Traffic Signs: in accordance with MUTCD standards.
- C. Sign Pole as indicated on Drawings

1.3 RELATED WORK:

The following items are not included in this Section and will be performed under the designated Sections:

- A. Section 312000 - EARTH MOVING for aggregate subbase and base courses and for aggregate pavement shoulders.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated include technical data and tested physical and performance properties.
- B. Shop Drawings: submit shop drawings for complete RRFB assembly

1. Comply with requirements of MUTCD (2009 Edition) and Massachusetts Amendments to the MUTCD
2. Comply with requirements of the Massachusetts DOT Highway Division Standard Specifications for Highways and Bridges, including supplemental specifications and special provisions.
3. Comply with requirements of the Americans with Disabilities Act (ADA) and the Massachusetts Architectural Access Board (MAAB). If these requirements cannot be met with the grades and slopes indicated on the plans, notify the Designer immediately.
4. Comply with requirements of the local authority having jurisdiction concerning the location and construction of accessible curb cuts.

C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in

1. Review methods and procedures related to installation of Signs
 - a. Review proposed sources of materials
 - b. Review condition of subgrade and preparatory work.
 - c. Review exact location of signage
 - d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver signage materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store signage materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.6 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

- 2.1 Traffic signs: provide standard signs that comply with MUTCD requirements and as shown on the Construction Drawings.
- 2.2 Rapid Flash Beacon (RRFB):
 - A. The RRFB sign assembly includes the rectangular beacons, signs, sign support structure, , electronics, conduit, pull box, wiring, grounding, pedestrian pushbutton, solar panel assembly and all necessary appurtenances needed to meet the requirements of these Specifications.

- B. Power Supply: Solar powered systems must be designed to provide a minimum of 10 days of continuous operation without sunlight. Solar powered systems must automatically charge batteries and prevent overcharging and over-discharging. Solar powered
- C. Aluminum materials must meet the requirements of the Aluminum Association Alloy 6061-T6 (ASTM B209, B221, B308 or B429), except as noted.
- D. Cabinets, Housings, and Hardware: Cabinets used as part of the midblock crosswalk enhancement assembly must meet the applicable criteria of Massachusetts DOT Highway Division Standard Specifications for Highways and Bridges.
- E. All housings other than approved cabinets must be powder coat painted dull black (Federal Standard 595A-37038) with a reflectance value not exceeding 25 percent as measured by American Society for Testing and Material E1347. Cabinets and housings must prevent unauthorized access.
- F. Ensure all assembly hardware, including nuts, bolts, external screws and locking washers less than 5/8 inch in diameter, are Type 304 or 316 passivated stainless steel. Stainless steel bolts, screws, and studs must meet ASTM F593. Stainless steel nuts must meet ASTM F594. All assembly hardware greater than or equal to 5/8 inch in diameter must be galvanized. Carbon steel bolts, studs, and threaded rod must meet ASTM A307. Structural bolts must meet ASTM A325.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. General: Locate signs and accessories where indicated, using mounting methods of types described and in compliance with manufacturer's written instructions.
- B. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.
- C. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading.
- D. The Contractor shall place and orient the RRFB display sign in such a manner as to optimize viewing and detection angles using the manufacturer's recommendations and instructions for installation and as approved by the Engineer.
- E. If the Engineer determines that the unit is not functioning properly, the Contractor shall secure the services of the manufacturer's representative for the installation and testing and if necessary, for the orientation of the RRFB components, to include orienting the solar panel array for optimum performance.

END OF SECTION

END OF TECHNICAL SPECIFICATIONS

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

That we _____(Name of Contractor) a
_____ (Corporation, Partnership or Individual) hereinafter
called "Principal" and _____ (Surety) of
_____, State of _____
hereinafter called the "Surety," are held and firmly bound unto the Town of Winchester,
Massachusetts, _____ hereinafter called
"Owner," in the sum of _____ Dollars (\$ _____
_____) in lawful money of the United States for the payment of which sum well and truly to be
made, we bind ourselves, and heirs, executors, administrators and successors, jointly and severally,
firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION is such that whereas, the Principal entered into a
certain contract with the Owner, dated the ____ day of _____, 20____, a copy of which is hereto
attached and made a part hereof for _____

_____.

NOW, THEREFORE, if the Principal shall promptly make payments to all persons, firms,
subcontractors and corporations furnishing materials for or performing labor in the prosecution of
the work provided for in such contract, and any authorized extensions or modification thereof,
including all amounts due for materials, lubricants, oil, gasoline, coal, and coke, repairs on
machinery, equipment and tools, consumed or used in connection with the construction of such
work, and all telephone, electric, water or other utility service, or rental of equipment directly
applicable to the contract, and all insurance premiums on said work, and for all labor, performed
in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise
to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulated and agrees that
no change, extension of time, alteration or addition to the terms of the contract or to the work to
be performed thereunder of the specifications accompanying the same shall in any wise affect its
obligation on this bond, and it does hereby waive notice of any such change, extension of time,
alteration or addition to the terms of the contract or to the work or to the specifications.

PROVIDED, FURTHER, that the amount of this bond shall be reduced by and to the extent of any
payment or payments made in good faith hereunder, inclusive of the payment by Surety of
mechanics' liens which may be filed or recorded against such improvements, whether or not claim
for the amount of such lien be presented under and against this bond.

In WITNESS WHEREOF, we hereto set out hands and seals, this the ____ day of _____,
20____.

ATTEST:

(Principal Secretary)

(SEAL)

Witness as to Principal

(Address – Zip Code)

ATTEST:

(Surety Secretary)

(SEAL)

Witness as to Surety

(Address – Zip Code)

Principal

By: _____(S)

(Address – Zip Code)

Surety

By: _____
Attorney-in-Fact

(Address – Zip Code)

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute Bond.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we _____ (Name of Contractor)
a _____ (Corporation, Partnership or Individual)
hereinafter called "Principal" and _____ (Surety) of
_____, State of _____
hereinafter called the "Surety," are held and firmly bound unto the Town of Winchester,
Massachusetts, _____ hereinafter called
"Owner," in the sum of _____ Dollars (\$____
_____) in lawful money of the United States for the payment of which sum well and truly to be
made, we bind ourselves, and heirs, executors, administrators and successors, jointly and severally,
firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION is such that whereas, the Principal entered into a
certain contract with the Owner, dated the ____ day of _____, 20__, a copy of which is hereto
attached and made a part hereof for _____

_____.

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the
undertakings, covenants, terms, conditions and agreements of said contract during the original
term thereof, and any extension thereof which may be granted by the Owner, with or without notice
to the surety, and if he shall satisfy all claims and demands incurred under such contract, and shall
fully indemnify and save harmless the Owner from all costs and damages which it may suffer by
reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which
the Owner may incur in making good any default, and make at its own cost and expense any and
all defects and deficiencies in materials or workmanship which may appear in the work provided
for in said contract within the period of one (1) year from the date of approval and acceptance of
all work under said contract, then this obligation shall be void; otherwise to remain in full force
and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulated and agrees that
no change, extension of time, alteration or addition to the terms of the contract or to the work to
be performed thereunder or the specifications accompanying the same shall in any wise affect its
obligation, on this bond, and it does hereby waive notice of any such change, extension of time,
alteration or addition to the terms of the contract or to the work or to the specifications.

AND PROVIDED, however, that the Surety and Sureties, for value received, hereby stipulates and
agrees to fully perform and complete the work mentioned and described in said contract and
specifications, or cause said work to be performed and completed pursuant to the terms, conditions
and covenants thereof, if for any cause, said Principal fails or neglects to fully perform and
complete said work; and the Surety of Sureties further agree to commence said work of completion
or cause said work of completion to commence within twenty (20) days notice thereof from the
Owner and to complete same or cause same to be completed within twenty (20) days of the time
allowed, said Principal, in said contract and specifications for the completion of said work.

AND PROVIDED, THAT THE SAID Surety and Sureties, for value received hereby further stipulate that should the Principal for any reason terminate the contract and have the contract terminated, the Owner shall have the right to complete the contract, under the direction of its own Engineer with all rules, regulations, clauses, etc., of the original contract and specifications in full effect.

PROVIDED FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any claimant hereunder, whose claim may be unsatisfied.

In WITNESS WHEREOF, we hereto set out hands and seals, this the ____ day of _____, 20____.

ATTEST:

(Principal Secretary)

(SEAL)

Witness as to Principal

(Address – Zip Code)

ATTEST:

(Surety Secretary)

(SEAL)

Witness as to Surety

Principal

By: _____(S)

(Address – Zip Code)

Surety

By: _____
Attorney-in-Fact

(Address – Zip Code)

(Address – Zip Code)

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute Bond.